Validation Qualifiers in database

checked by IR 2/3/17

-IR

CETIFICATION

SDG No:	JC33375	Laboratory:	Accutest, New Jersey
Site:	BMS, Building 5 Area, PR Humacao, PR	Matrix:	Groundwater

SUMMARY: Groundwater samples (Table 1) were collected on the BMSMC facility – Building 5 Area. The BMSMC facility is located in Humacao, PR. Samples were taken December 6, 2016 and were analyzed in Accutest Laboratory of Dayton, New Jersey for the parameters shown in Table 1. The results were reported under SDG No.: JC33375. Results were validated using the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. Individual data review worksheets are enclosed for each target analyte group. The data sample summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

SAMPLE ID	SAMPLE DESCRIPTION	MATRIX	ANALYSIS PERFORMED
JC33375-1	OSMW-3S	Groundwater	SVOCs: PAHs + 1,4-Dioxane (SIM); Pesticides; Inorganics; Methane
JC33375-2	OSMW-4S	Groundwater	SVOCs: PAHs + 1,4-Dioxane (SIM); Pesticides; Inorganics; Methane

Reviewer Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: January 14, 2017

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Rafael Infante Méndez
IC # 1888
QUIMICO LICENCIADO
$100
A 1600860

Raw Data: P109786.D

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-3S		
Lab Sample ID:	JC33375-1	Date Sampled:	12/06/16
Matrix:	AQ - Ground Water	Date Received:	12/09/16
Method:	SW846 8270D SW846 3510C	Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	P109786.D	1	12/14/16	RL	12/13/16	OP99167	EP4874
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
100-52-7	Benzaldehyde	ND	5.0	0.29	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		32-128%
321-60-8	2-Fluorobiphenyl	81%		35-119%
1718-51-0	Terphenyl-d14	94%		10-126%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-3S		
Lab Sample ID:	JC33375-1	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3P57222.D	1	12/14/16	SG	12/13/16	OP99167A	E3P2653
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
56-55-3	Benzo(a)anthracene	ND	0.050	0.023	ug/l	
91-20-3	Naphthalene	ND	0.10	0.029	ug/l	
123-91-1	1,4-Dioxane	1.73	0.10	0.049	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	71%		24-125%
321-60-8	2-Fluorobiphenyl	74%		19-127%
1718-51-0	Terphenyl-d14	68%		10-119%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: AA56399.D

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-3S		
Lab Sample ID:	JC33375-1	Date Sampled:	12/06/16
Matrix:	AQ - Ground Water	Date Received:	12/09/16
Method:	RSK-175	Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA56399.D	1	12/16/16	LM	n/a	n/a	GAA1095
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	3.2	0.11	0.036	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-3S			
Lab Sample ID:	JC33375-1		Date Sampled:	12/06/16
Matrix:	AQ - Ground Water		Date Received:	12/09/16
Method:	SW846 8081B SW846 3510C		Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1G130505.D	1	12/14/16	KD	12/13/16	OP99172	G1G4171
Run #2							

	Initial Volume	Final Volume
Run #1	960 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
60-57-1	Dieldrin	ND	0.010	0.0038	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	97%		26-132%
877-09-8	Tetrachloro-m-xylene	90%		26-132%
2051-24-3	Decachlorobiphenyl	60%		10-118%
2051-24-3	Decachlorobiphenyl	60%		10-118%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	OSMW-3S		
Lab Sample ID:	JC33375-1	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
		Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR		

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Iron	3020	100	12	ug/l	1	12/12/16	12/15/16	AB	SW846 6010C [1]	SW846 3010A [2]
Manganese	379	15	0.39	ug/l	1	12/12/16	12/15/16	AB	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA40966
(2) Prep QC Batch: MP97572

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	OSMW-3S		
Lab Sample ID:	JC33375-1	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
		Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	214	5.0	mg/l	1	12/15/16 22:50	CB	SM2320 B-11
Iron, Ferric [a]	3.0	0.30	mg/l	1	12/15/16 14:21	AB	SM3500FE B-11
Iron, Ferrous [b]	<0.20	0.20	mg/l	1	12/10/16 13:28	YR	SM3500FE B-11
Nitrogen, Nitrate [c]	<0.11	0.11	mg/l	1	12/21/16 13:19	YZ	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	<0.10	0.10	mg/l	1	12/21/16 13:19	YZ	EPA 353.2/LACHAT
Nitrogen, Nitrite [d]	<0.010	0.010	mg/l	1	12/09/16 22:48	CB	SM4500NO2 B-11
Sulfate	22.1	10	mg/l	1	12/19/16 21:56	JN	EPA 300/SW846 9056A
Sulfide	<2.0	2.0	mg/l	1	12/13/16 14:53	JA	SM4500S2- F-11

(a) Calculated as: (Iron) - (Iron, Ferrous)
(b) Field analysis required. Received out of hold time and analyzed by request.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite) Nitrogen, Nitrite analysis done past holding time.
(d) Sample received outside the holding time.

RL = Reporting Limit

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-4S		
Lab Sample ID:	JC33375-2	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	P109787.D	1	12/14/16	RL	12/13/16	OP99167	EP4874
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
100-52-7	Benzaldehyde	ND	5.1	0.29	ug/l	
123-91-1	1,4-Dioxane	31.5	1.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	68%		32-128%
321-60-8	2-Fluorobiphenyl	77%		35-119%
1718-51-0	Terphenyl-d14	92%		10-126%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-4S		
Lab Sample ID:	JC33375-2	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3P57223.D	1	12/14/16	SG	12/13/16	OP99167A	E3P2653
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
56-55-3	Benzo(a)anthracene	ND	0.051	0.023	ug/l	
91-20-3	Naphthalene	ND	0.10	0.030	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	71%		24-125%
321-60-8	2-Fluorobiphenyl	76%		19-127%
1718-51-0	Terphenyl-d14	67%		10-119%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-4S		
Lab Sample ID:	JC33375-2	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
Method:	RSK-175	**Percent Solids:**	n/a
Project:	BMSMC, Building 5 Area, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA56401.D	5	12/16/16	LM	n/a	n/a	GAA1095
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	246	0.55	0.18	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest LabLink@939893 10:02 27-Dec-2016

Report of Analysis

Client Sample ID:	OSMW-4S			
Lab Sample ID:	JC33375-2	**Date Sampled:**	12/06/16	
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16	
Method:	SW846 8081B SW846 3510C	**Percent Solids:**	n/a	
Project:	BMSMC, Building 5 Area, PR			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1G130506.D	1	12/14/16	KD	12/13/16	OP99172	G1G4171
Run #2							

	Initial Volume	Final Volume
Run #1	940 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
60-57-1	Dieldrin	ND	0.011	0.0038	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	90%		26-132%
877-09-8	Tetrachloro-m-xylene	93%		26-132%
2051-24-3	Decachlorobiphenyl	77%		10-118%
2051-24-3	Decachlorobiphenyl	85%		10-118%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	OSMW-4S		
Lab Sample ID:	JC33375-2	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
		Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR		

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Iron	3020	100	12	ug/l	1	12/12/16	12/15/16	AB	SW846 6010C [1]	SW846 3010A [2]
Manganese	454	15	0.39	ug/l	1	12/12/16	12/15/16	AB	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA40966
(2) Prep QC Batch: MP97572

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	OSMW-4S		
Lab Sample ID:	JC33375-2	**Date Sampled:**	12/06/16
Matrix:	AQ - Ground Water	**Date Received:**	12/09/16
		Percent Solids:	n/a
Project:	BMSMC, Building 5 Area, PR		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	335	5.0	mg/l	1	12/15/16 22:50	CB	SM2320 B-11
Iron, Ferric [a]	2.9	0.30	mg/l	1	12/15/16 14:31	AB	SM3500FE B-11
Iron, Ferrous [b]	< 0.20	0.20	mg/l	1	12/10/16 13:35	YR	SM3500FE B-11
Nitrogen, Nitrate [c]	< 0.11	0.11	mg/l	1	12/21/16 13:20	YZ	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	12/21/16 13:20	YZ	EPA 353.2/LACHAT
Nitrogen, Nitrite [d]	< 0.010	0.010	mg/l	1	12/09/16 22:48	CB	SM4500NO2 B-11
Sulfate	< 10	10	mg/l	1	12/19/16 22:20	JN	EPA 300/SW846 9056A
Sulfide	< 2.0	2.0	mg/l	1	12/13/16 14:53	JA	SM4500S2- F-11

(a) Calculated as: (Iron) - (Iron, Ferrous)
(b) Field analysis required. Received out of hold time and analyzed by request.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite) Nitrogen, Nitrite analysis done past holding time.
(d) Sample received outside the holding time.

RL = Reporting Limit

ACCUTEST LABORATORIES

NJ

GW

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TEL. 732-329-0200 FAX 732-329-3499/3480
www.accutest.com

PAGE 1 OF 1 PN/E

FED-EX Tracking # 7778 9563 2357
Bottle Order Control #
Accutest Quote #
Accutest Job # JC33375

Client / Reporting Information

Company Name: Anderson Mulholland & Associates
Street Address: 2700 Westchester Avenue, Suite 417
City: Purchase State: NY Zip: 10577
Project Contact: Terry Taylor E-mail:
Phone #: 914-251-0400 Fax #:
Sampler(s) Name(s): Phone #:

Project Information

Project Name: 4th Q 2016 Groundwater Sampling - Offsite Well
Street:
City: Humacao State: PR
Project #:
Client Purchase Order #:
Project Manager: Terry Taylor

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED - Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB - Field Blank, EB - Equipment Blank, RB - Rinse Blank, TB - Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled By	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	B8270SIMNAP	BSIM+BANTH	BSIM+14DIOX	B8270BAH	P8081DIELDRIN	ALK	XFE3	MN	VRSK175CH4	XN030	SO4, S	LAB USE ONLY
1	OSMW-3S		12-6-16	1222	RS	GW	13	3	2	1	1	6				X	X	X	X	X	X	X	X	X	X	X	B11
2	OSMW-4S		12-6-16	1514	RS	GW	13	3	2	1	1	6				X	X	X	X	X	X	X	X	X	X	X	A33
3	OSMW-6S		12-5-16	1258			1																				G40
																											M10
																											V778

Turnaround Time (Business Days)

- [X] Std. 15 Business Days
- [ ] Std. 10 Business Days (by Contract only)
- [ ] 10 Day RUSH
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [X] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASSESSMENT 3.4 Air
LABEL VERIFICATION 2Y

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	12-8-16 1300	1 Fed EX	2 FX	12/9/16 12:30	2 [signature]
3		3	4		4
5		5	Custody Seal # G1660, 616, 619, 620, 621	Intact / Not intact	Preserved where applicable: [signature]

On Ice: [X] Cooler Temp. 2.8; 3.1; 3.2; 3.8; 2.4; 2.5

JC33375: Chain of Custody
Page 1 of 3

EXECUTIVE NARRATIVE

SDG No:	JC33375	Laboratory:	Accutest, New Jersey
Analysis:	SW846-8270D	Number of Samples:	2
Location:	BMSMC, Building 5 Area Humacao, PR		

SUMMARY: Two (2) samples were analyzed for selected SVOCs following method SW846-8270D and Selected PAHs and 1,4-Dioxane were also analyzed by SW846-8270D using the selective ion monitoring (SIM) technique. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. Semivolatile Data Validation. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues:	**None**
Major:	**None**
Minor:	**None**
Critical findings:	**None**
Major findings:	**None**
Minor findings:	**1.** Initial and continuing calibration verifications meet the method and guidance document required performance criteria except in the cases described in the Data Review Worksheet. Results for Benzo(a)anthracene were qualified as estimated (J or UJ) in affected samples. No closing calibration verification included in data package. No action taken, professional judgment. QC samples were not validated.

COMMENTS:	Results are valid and can be used for decision making purposes.
Reviewers Name:	Rafael Infante Chemist License 1888
Signature:	
Date:	January 14, 2017

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC33375-1
Sample location: BMSMC Building 5 Area
Sampling date: 6-Dec-16
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Benzaldehyde	5.0	ug/l	1	-	U	Yes

METHOD: 8270D (SIM)

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Benzo(a)anthracene	0.050	ug/l	1	-	UJ	Yes
Naphthalene	0.10	ug/l	1	-	U	Yes
1,4-Dioxane	1.73	ug/l	1	-	-	Yes

Sample ID: JC33375-2
Sample location: BMSMC Building 5 Area
Sampling date: 6-Dec-16
Matrix: Groundwater

METHOD: 8270D

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Benzaldehyde	5.1	ug/l	1	-	U	Yes
1,4-Dioxane	31.5	ug/l	1	-	-	Yes

METHOD: 8270D (SIM)

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Benzo(a)anthracene	0.051	ug/l	1	-	UJ	Yes
Naphthalene	0.10	ug/l	1	-	U	Yes

DATA REVIEW WORKSHEETS

Project Number: JC33375
Date: December 6
Shipping Date: December 8, 2016
EPA Region: 2

REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) Accutest data package received has been reviewed and the quality control and performance data summarized. The data review for SVOCs included:

Lab. Project/SDG No.: JC33375 Sample matrix: Groundwater
No. of Samples: 2_SIM/2_SCAN

Trip blank No.: -
Field blank No.: FB120616
Equipment blank No.: EB120616
Field duplicate No.: -

X Data Completeness	X Laboratory Control Spikes
X Holding Times	X Field Duplicates
X GC/MS Tuning	X Calibrations
X Internal Standard Performance	X Compound Identifications
X Blanks	X Compound Quantitation
X Surrogate Recoveries	X Quantitation Limits
X Matrix Spike/Matrix Spike Duplicate	

Overall Comments: Selected_SVOCs_from_the_TCL_special_list_analyzed_by_method_SW846-8270D; Selected_PAHs and 1,4-Dioxane_analyzed_by_method_SW846-8270D_(SIM) Field_and_Equipment_Blanks_validated_in_another_job.

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer: Rafael Infante
Date: January 14, 2017

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	pH	ACTION
All samples extracted and analyzed within method recommended holding.				

Cooler temperature (Criteria: 4 ± 2 °C): _____5.2°C_____

Actions

Results will be qualified based on the criteria of the following Table:

Table 1. Holding Time Actions for Semivolatile Analyses

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 7 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 7 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 7 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R
Non-Aqueous	No	≤ 14 days (for extraction) ≤ 40 days (for analysis)	Use professional judgment	
	No	> 14 days (for extraction) > 40 days (for analysis)	J	Use professional judgment
	Yes	≤ 14 days (for extraction) ≤ 40 days (for analysis)	No qualification	
	Yes	> 14 days (for extraction) > 40 days (for analysis)	J	UJ
	Yes/No	Grossly Exceeded	J	UJ or R

All criteria were met _X__
Criteria were not met see below ____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

_X__ The DFTPP performance results were reviewed and found to be within the specified criteria.

_X__ DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

Notes: These requirements do not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.

All mass spectrometer conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortion are unacceptable

Notes: No data should be qualified based of DFTPP failure.

The requirement to analyze the instrument performance check solution is optional when analysis of PAHs/pentachlorophenol is to be performed by the SIM technique.

List the samples affected:

Actions:

1. If sample are analyzed without a preceding valid instrument performance check or are analyzed 12 hours after the Instrument Performance Check, qualify all data in those samples as unusable (R).
2. If ion abundance criteria are not met, use professional judgment to determine to what extent the data may be utilized.
3. State in the Data Review Narrative, decisions to use analytical data associated with DFTPP instrument performance checks not meeting the contract requirements.
4. Use professional judgment to determine if associated data should be qualified based on the spectrum of the mass calibration compounds.

All criteria were met ___X___
Criteria were not met
and/or see below _____

INITIAL CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____10/18/16_(SIM)___
Instrument ID numbers:_____GCMS3P_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:_12/08/16_(SCAN)_____ _____11/18/16_(SCAN)_____
Instrument ID numbers:_____GCMS3E_____ _____GCMS6P_____
Matrix/Level:_____Aqueous/low_____ _____Aqueous/low_____

Date of initial calibration:_11/28-29/16_(SCAN)___
Instrument ID numbers:_____GCMSP_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and initial calibration verification meets the method and guidance validation document performance criteria.				

Note:

Actions:

Qualify the initial calibration analytes listed in Table 2 using the following criteria:

Table 3. Initial Calibration Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Initial Calibration not performed at specified frequency and sequence	Use professional judgment R	Use professional judgment R
Initial Calibration not performed at the specified concentrations	J	UJ
RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J+ or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%RSD > Maximum %RSD in Table 2 for target analyte	J	Use professional judgment
%RSD ≤ Maximum %RSD in Table 2 for target analyte	No qualification	No qualification

Initial Calibration

Table 2. RRF, %RSD, and %D Acceptance Criteria in Initial Calibration and CCV for Semivolatil Analysis

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
1,4-Dioxane	0.010	40.0	± 40.0	± 50.0
Benzaldehyde	0.100	40.0	± 40.0	± 50.0
Phenol	0.080	20.0	± 20.0	± 25.0
Bis(2-chloroethyl)ether	0.100	20.0	± 20.0	± 25.0
2-Chlorophenol	0.200	20.0	± 20.0	± 25.0
2-Methylphenol	0.010	20.0	± 20.0	± 25.0
3-Methylphenol	0.010	20.0	± 20.0	± 25.0
2,2'-Oxybis-(1-chloropropane)	0.010	20.0	± 25.0	± 50.0
Acetophenone	0.060	20.0	± 20.0	± 25.0
4-Methylphenol	0.010	20.0	± 20.0	± 25.0
N-Nitroso-di-n-propylamine	0.080	20.0	± 25.0	± 25.0
Hexachloroethane	0.100	20.0	± 20.0	± 25.0
Nitrobenzene	0.090	20.0	± 20.0	± 25.0
Isophorone	0.100	20.0	± 20.0	± 25.0
2-Nitrophenol	0.060	20.0	± 20.0	± 25.0
2,4-Dimethylphenol	0.050	20.0	± 25.0	± 50.0
Bis(2-chloroethoxy)methane	0.080	20.0	± 20.0	± 25.0
2,4-Dichlorophenol	0.060	20.0	± 20.0	± 25.0
Naphthalene	0.200	20.0	± 20.0	± 25.0
4-Chloroaniline	0.010	40.0	± 40.0	± 50.0
Hexachlorobutadiene	0.040	20.0	± 20.0	± 25.0
Caprolactam	0.010	40.0	± 30.0	± 50.0
4-Chloro-3-methylphenol	0.040	20.0	± 20.0	± 25.0
2-Methylnaphthalene	0.100	20.0	± 20.0	± 25.0
Hexachlorocyclopentadiene	0.010	40.0	± 40.0	± 50.0
2,4,6-Trichlorophenol	0.090	20.0	± 20.0	± 25.0
2,4,5-Trichlorophenol	0.100	20.0	± 20.0	± 25.0
1,1'-Biphenyl	0.200	20.0	± 20.0	± 25.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
2-Chloronaphthalene	0.300	20.0	± 20.0	± 25.0
2-Nitroaniline	0.060	20.0	± 25.0	± 25.0
Dimethylphthalate	0.300	20.0	± 25.0	± 25.0
2,6-Dinitrotoluene	0.080	20.0	± 20.0	± 25.0
Acenaphthylene	0.400	20.0	± 20.0	± 25.0
3-Nitroaniline	0.010	20.0	± 25.0	± 50.0
Acenaphthene	0.200	20.0	± 20.0	± 25.0
2,4-Dinitrophenol	0.010	40.0	± 50.0	± 50.0
4-Nitrophenol	0.010	40.0	± 40.0	± 50.0
Dibenzofuran	0.300	20.0	± 20.0	± 25.0
2,4-Dinitrotoluene	0.070	20.0	± 20.0	± 25.0
Diethylphthalate	0.300	20.0	± 20.0	± 25.0
1,2,4,5-Tetrachlorobenzene	0.100	20.0	± 20.0	± 25.0
4-Chlorophenyl-phenylether	0.100	20.0	± 20.0	± 25.0
Fluorene	0.200	20.0	± 20.0	± 25.0
4-Nitroaniline	0.010	40.0	± 40.0	± 50.0
4,6-Dinitro-2-methylphenol	0.010	40.0	± 30.0	± 50.0
4-Bromophenyl-phenyl ether	0.070	20.0	± 20.0	± 25.0
N-Nitrosodiphenylamine	0.100	20.0	± 20.0	± 25.0
Hexachlorobenzene	0.050	20.0	± 20.0	± 25.0
Atrazine	0.010	40.0	± 25.0	± 50.0
Pentachlorophenol	0.010	40.0	± 40.0	± 50.0
Phenanthrene	0.200	20.0	± 20.0	± 25.0
Anthracene	0.200	20.0	± 20.0	± 25.0
Carbazole	0.050	20.0	± 20.0	± 25.0
Di-n-butylphthalate	0.500	20.0	± 20.0	± 25.0
Fluoranthene	0.100	20.0	± 20.0	± 25.0
Pyrene	0.400	20.0	± 25.0	± 50.0
Butylbenzylphthalate	0.100	20.0	± 25.0	± 50.0

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Opening Maximum %D[1]
3,3'-Dichlorobenzidine	0.010	40.0	± 40.0	± 50.0
Benzo(a)anthracene	0.300	20.0	± 20.0	± 25.0
Chrysene	0.200	20.0	± 20.0	± 50.0
Bis(2-ethylhexyl) phthalate	0.200	20.0	± 25.0	± 50.0
Di-n-octylphthalate	0.010	40.0	± 40.0	± 50.0
Benzo(b)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(k)fluoranthene	0.010	20.0	± 25.0	± 50.0
Benzo(a)pyrene	0.010	20.0	± 20.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.010	20.0	± 25.0	± 50.0
Dibenzo(a,h)anthracene	0.010	20.0	± 25.0	± 50.0
Benzo(g,h,i)perylene	0.010	20.0	± 30.0	± 50.0
2,3,4,6-Tetrachlorophenol	0.040	20.0	± 20.0	± 50.0
Naphthalene	0.600	20.0	± 25.0	± 25.0
2-Methylnaphthalene	0.300	20.0	± 20.0	± 25.0
Acenaphthylene	0.900	20.0	± 20.0	± 25.0
Acenaphthene	0.500	20.0	± 20.0	± 25.0
Fluorene	0.700	20.0	± 25.0	± 50.0
Phenanthrene	0.300	20.0	± 25.0	± 50.0
Anthracene	0.400	20.0	± 25.0	± 50.0
Fluoranthene	0.400	20.0	± 25.0	± 50.0
Pyrene	0.500	20.0	± 30.0	± 50.0
Benzo(a)anthracene	0.400	20.0	± 25.0	± 50.0
Chyrsene	0.400	20.0	± 25.0	± 50.0
Benzo(b)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(k)fluoranthene	0.100	20.0	± 30.0	± 50.0
Benzo(a)pyrene	0.100	20.0	± 25.0	± 50.0
Indeno(1,2,3-cd)pyrene	0.100	20.0	± 40.0	± 50.0
Dibenzo(a,h)anthracene	0.010	25.0	± 40.0	± 50.0
Benzo(g,h,i)perylene	0.020	25.0	± 40.0	± 50.0

Pentachlorophenol	0.010	40.0	± 50.0	± 50.0
Deuterated Monitoring Compounds				

Analyte	Minimum RRF	Maximum %RSD	Opening Maximum %D[1]	Closing Maximum %D
1,4-Dioxane-d_8	0.010	20.0	± 25.0	± 50.0
Phenol-d_5	0.010	20.0	± 25.0	± 25.0
Bis-(2-chloroethyl)ether-d_8	0.100	20.0	± 20.0	± 25.0
2-Chlorophenol-d_4	0.200	20.0	± 20.0	± 25.0
4-Methylphenol-d_8	0.010	20.0	± 20.0	± 25.0
4-Chloroaniline-d_4	0.010	40.0	± 40.0	± 50.0
Nitrobenzene-d_5	0.050	20.0	± 20.0	± 25.0
2-Nitrophenol-d_4	0.050	20.0	± 20.0	± 25.0
2,4-Dichlorophenol-d_3	0.060	20.0	± 20.0	± 25.0
Dimethylphthalate-d_6	0.300	20.0	± 20.0	± 25.0
Acenaphthylene-d_8	0.400	20.0	± 20.0	± 25.0
4-Nitrophenol-d_4	0.010	40.0	± 40.0	± 50.0
Fluorene-d_{10}	0.100	20.0	± 20.0	± 25.0
4,6-Dinitro-2-methylphenol-d_2	0.010	40.0	± 30.0	± 50.0
Anthracene-d_{10}	0.300	20.0	± 20.0	± 25.0
Pyrene-d_{10}	0.300	20.0	± 25.0	± 50.0
Benzo(a)pyrene-d_{12}	0.010	20.0	± 20.0	± 50.0
Fluoranthene-d_{10} (SIM)	0.400	20.0	± 25.0	± 50.0
2-Methylnaphthalene-d_{10} (SIM)	0.300	20.0	± 20.0	± 25.0

[1] If a closing CCV is acting as an opening CCV, all target analytes must meet the requirements for an opening CCV.

Note: If analysis by SIM technique is requested for PAH/pentachlorophenols, calibration standards analyzed at 0.10, 0.20, 0.40, 0.80, and 1.0 ng/uL for each target compound of interest and the associated DMCs. Pentachlorophenol will require only a four point initial calibration at 0.20, 0.40, 0.80, and 1.0 ng/uL.

All criteria were met _____
Criteria were not met
and/or see below ____X____

CONTINUING CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____10/18/16_(SIM)_____
Date of initial calibration verification (ICV):___10/19/16_____
Date of continuing calibration verification (CCV):_12/14/16;_12/17/16__
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCMS3P_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:_____11/28-29/16_(Scan)_____ ____11/18/16_(Scan)_____
Date of initial calibration verification (ICV):_11/29/306_____ ____11/18/16:_11/21/16____
Date of continuing calibration verification (CCV):_12/14/16_____ ____12/14/16_____
Date of closing CCV:_____-_____ _____-_____
Instrument ID numbers:_____GCMSP_____ _____GCMS6P_____
Matrix/Level:_____Aqueous/low_____ _____Aqueous/low_____

Date of initial calibration:_____12/08/16_(Scan)_____
Date of initial calibration verification (ICV):_12/08-09/16_____
Date of continuing calibration verification (CCV):_12/15/16_____
Date of closing CCV:_____-_____
Instrument ID numbers:_____GCSM3E_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
GCMS3P				
12/14/16	cc2579-0.5	-42.3	Benzo(a)anthracene	JC33375-1; -2

Note: Initial and continuing calibration verifications meet the method and guidance document required performance criteria except for the cases described in this document. Results qualified as estimated (J or UJ) in affected samples.

performance criteria but within the guidance document performance criteria. No action taken.

No action taken for QC samples.

No closing calibration verification included in data package. No action taken, professional judgment.

Actions:

Notes: Verify that the CCV is run at the required frequency (an opening and closing CCV must be run within 12-hour period).

All DMCs must meet the RRF values given in Table 2. No qualification of the data is necessary on DMCs RRF and %RSD/%D alone. Use professional judgment to evaluate DMCs and %RSD/%D data in conjunction with DMCs recoveries to determine the need for qualification of the data.

Qualify the initial calibration analytes listed in Table 2 using the following criteria in the CCVs:

Table 4. CCV Actions for Semivolatile Analysis

Criteria for Opening CCV	Criteria for Closing CCV	Action	
		Detect	Non-detect
CCV not performed at required frequency and sequence	CCV not performed at required frequency	Use professional judgment R	Use professional judgment R
CCV not performed at specified concentration	CCV not performed at specified concentration	Use professional judgment	Use professional judgment
RRF < Minimum RRF in Table 2 for target analyte	RRF < Minimum RRF in Table 2 for target analyte	Use professional judgment J or R	R
RRF ≥ Minimum RRF in Table 2 for target analyte	RRF ≥ Minimum RRF in Table 2 for target analyte	No qualification	No qualification
%D outside the Opening Maximum %D limits in Table 2 for target analyte	%D outside the Closing Maximum %D limits in Table 2 for target analyte	J	UJ
%D within the inclusive Opening Maximum %D limits in Table 2 for target analyte	%D within the inclusive Closing Maximum %D limits in Table 2 for target analyte	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Notes: The concentration of non-target compounds in all blanks must be less than or equal to 10 ug/L.

The concentration of target compounds in all blanks must be less than its CRQL listed in the method.

Samples taken from a drinking water tap do not have and associated field blank.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_target_analytes_detected_in_method_blanks._____				

Note:

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_target_analytes_detected_in_the_field/equipment_blanks_analyzed_with_this_data_package._____				
_Field_and_equipment_blanks_validated_in_another_job._____				

Note:

All criteria were met __X__
Criteria were not met

and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Qualify samples based on the criteria summarized in Table 5:

Table 5. Blank and TCLP/SPLP LEB Actions for Semivolatile Analysis

Blank Type	Blank Result	Sample Result	Action
Method, TCLP/SPLP LEB, Field	Detect	Non-detect	No qualification
	< CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL	Use professional judgment
	≥ CRQL	< CRQL	Report at CRQL and qualify as non-detect (U)
		≥ CRQL but < Blank Result	Report at sample results and qualify as non-detect (U) or as unusable (R)
		≥ CRQL and ≥ Blank Result	Use professional judgment
	Grossly high	Detect	Report at sample results and qualify as unusable (R)
	TIC > 5.0 ug/L (water) or 0.0050 mg/L (TCLP leachate) or TIC > 170 ug/Kg (soil)	Detect	Use professional judgment

List samples qualified

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met

and/or see below ____

SURROGATE SPIKE RECOVERIES – DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries – deuterated monitoring compounds. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Notes: Recoveries for DMCs in samples and blanks must be within the limits specified in Table 6.

The recovery limits for any of the compounds listed in Table 6 may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

If a DMC is not added in the samples and blanks or the concentrations of DMCs in the samples and blank not the specified, use professional judgment in qualifying the data.

Table 7. DMC Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
%R < 10% (excluding DMCs with 10% as a lower acceptance limit)	J-	R
10% ≤ %R (excluding DMCs with 10% as a lower acceptance limit) < Lower Acceptance Limit	J-	UJ
Lower Acceptance limit ≤ %R ≤ Upper Acceptance Limit	No qualification	No qualification
%R > Upper Acceptance Limit	J+	No qualification

List the percent recoveries (%Rs) which do not meet the criteria for DMCs (surrogate) recovery.

Matrix:___Groundwater_____

SAMPLE ID	SURROGATE COMPOUND	ACTION

_DMCs_meet_the_required_criteria_in_all_samples_analyzed._Non-_deuterated_surrogates_____
_added_to_the_samples_and_were_within_laboratory_recovery_limits._____

(a) Outside control limits due to matrix interference.
(b) Outside in house control limits biased low. The results confirmed by re-extraction outside the holding time.

Note:

Table 8. Semivolatile DMCs and the Associated Target Analytes

1,4–Dioxane-d_8 (DMC-1)	**Phenol-d_5 (DMC-2)**	**Bis(2-Chloroethyl) ether-d_8 (DMC-3)**
1,4-Dioxane	Benzaldehyde Phenol	Bis(2-chloroethyl)ether 2,2'-Oxybis(1-chloropropane) Bis(2-chloroethoxy)methane
2-Chlorophenol-d_4 (DMC-4)	**4-Methylphenol-d_8 (DMC-5)**	**4-Chloroaniline-d_4 (DMC-6)**
2-Chlorophenol	2-Methylphenol 3-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	4-Chloroaniline Hexachlorocyclopentadiene Dichlorobenzidine
Nitrobenzene-d_5 (DMC-7)	**2-Nitrophenol-d_4 (DMC-8)**	**2,4-Dichlorophenol-d_3 (DMC-9)**
Acetophenone N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,6-Dinitrotoluene 2,4-Dinitrotoluene N-Nitrosodiphenylamine	Isophorone 2-Nitrophenol	2,4-Dichlorophenol Hexachlorobutadiene Hexachlorocyclopentadiene 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 1,2,4,5-Tetrachlorobenzene *Pentachlorophenol 2,3,4,6-Tetrachlorophenol
Dimethylphthalate-d_6 (DMC-10)	**Acenaphthylene-d_8 (DMC-11)**	**4-Nitrophenol-d_4 (DMC-12)**
Caprolactam 1,1'-Biphenyl Dimethylphthalate Diethylphthalate Di-n-butylphthalate Butylbenzylphthalate Bis(2-ethylhexyl) phthalate Di-n-octylphthalate	*Naphthalene *2-Methylnaphthalene 2-Chloronaphthalene *Acenaphthylene *Acenaphthene	2-Nitroaniline 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline

Fluorene-d_{10} (DMC-13)	**4,6-Dinitro-2-methylphenol-d_2 (DMC-14)**	**Anthracene-d_{10} (DMC-15)**
Dibenzofuran *Fluorene 4-Chlorophenyl-phenylether 4-Bromophenyl-phenylether Carbazole	4,6-Dinitro-2-methylphenol	Hexachlorobenzene Atrazine *Phenanthrene *Anthracene
Pyrene-d_{10} (DMC-16)	**Benzo(a)pyrene-d_{12} (DMC-17)**	
*Fluoranthene *Pyrene *Benzo(a)anthracene *Chrysene	3,3'-Dichlorobenzidine *Benzo(b)fluoranthene *Benzo(k)fluoranthene *Benzo(a)pyrene *Indeno(1,2,3-cd)pyrene *Dibenzo(a,h)anthracene *Benzo(g,h,i)perylene	

*Included in optional Target Analyte List (TAL) of PAHs and PCP only.

Table 9. Semivolatile SIM DMCs and the Associated Target Analytes

Fluoranthene-d10 (DMC-1)	**2-Methylnaphthalene-d10 (DMC-2)**
Fluoranthene	Naphthalene
Pyrene	2-Methylnaphthalene
Benzo(a)anthracene	Acenaphthylene
Chrysene	Acenaphthene
Benzo(b)fluoranthene	Fluorene
Benzo(k)fluoranthene	Pentachlorophenol
Benzo(a)pyrene	Phenanthrene
Indeno(1,2,3-cd)pyrene	Anthracene
Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene	

All criteria were met ___X___
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

NOTES: Data for MS and MSDs will not be present unless requested by the Region. Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:_____JC33175-1_____ Matrix/Level:_____Groundwater___
Sample ID:_____JC33175-1_(SIM)_____ Matrix/Level:_____Groundwater___

Note: MS/MSD % recoveries and RPD within laboratory control limits.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Internal area meets the required criteria for batch samples corresponding to this data package.

Action:

1. If an internal standard area count for a sample or blank is greater than 200% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table 10 below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 50.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 10.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 10.0 seconds, no qualification of the data is necessary.

Note: Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

State in the Data Review Narrative if the required internal standard compounds are not added to a sample or blank or if the required internal standard compound is not analyzed at the specified concentration.

Actions:

Table 10. Internal Standard Actions for Semivolatile Analysis

Criteria	Action	
	Detect	Non-detect
Area response < 20% of the opening CCV or mid-point standard CS3 from ICAL	J+	R
20% ≤ Area response < 50% of the opening CCV or mid-point standard CS3 from ICAL	J+	UJ
50% ≤ Area response ≤ 200% of the opening CCV or mid-point standard CS3 from ICAL	No qualification	No qualification
Area response > 200% of the opening CCV or mid-point standard CS3 from ICAL	J-	No qualification
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL > 10.0 seconds	R	R
RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL < 10.0 seconds	No qualification	No qualification

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes?** or No?

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.
b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).
c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

Sample ID	Compounds	Actions
_Identified_compounds_meet_the_required_criteria____		

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

Sample ID	Compound	Sample ID	Compound

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).
4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).

5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met __X__
Criteria were not met
and/or see below _____

SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Action:

1. When a sample is analyzed at more than one dilution, the lower CRQL are used unless a QC exceedance dictates the use of higher CRQLs from the diluted sample. Samples reported with an "E" qualifier should be reported from the diluted sample.
2. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
3. For non-aqueous samples, if the solids is less than 10.0%, use professional judgment for both detects and non-detects. If the percent solid for a soil sample is greater than or equal to 10.0% and less than 30.0%, use professional judgment to qualify detects and non-detects. If the percent solid for a soil sample is greater than or equal to 30.0%, detects and non-detects should not be qualified (see Table 11).
4. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
5. Results between MDL and CRQL should be qualified as estimated "J".
6. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves should not be reported.

Table 11. Percent Solids Actions for Semivolatile Analysis for Non-Aqueous Samples

Criteria	Action	
	Detects	Non-detects
%Solids < 10.0%	Use professional judgment	Use professional judgment
10.0% ≤ %Solids ≤ 30.0%	Use professional judgment	Use professional judgment
%Solids > 30.0%	No qualification	No qualification

SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID:__ JC33375-2__(Scan)__ Analyte:__1,4-Dioxane __ RF:_0.668_

[ ] = (18574)(40.0)/(35623)(0.668)
= 31.2 ppm Ok

QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

All criteria were met _____
Criteria were not met
and/or see below ____N/A____

FIELD DUPLICATE PRECISION

Sample IDs:_____-_____ Matrix:_____-_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: if large RPD (> 50 %) is observed, confirm identification of the samples and note differences. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed as part of this data package. MS/MSD % recoveries RPD used to assess precision. RPD within the required guidance document criteria < 50 % for detected target analytes above 5 SQL.					

All criteria were met __X__
Criteria were not met
and/or see below _____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

Sample ID	Comments	Actions

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

Sample ID	Comments	Actions

_No_other_issues_that_required_the_need_to_qualify_the_data._Results_are_valid_and_can_be_used_for_decission_purposes._Other_discrepancies_are_shown_below._____

Note:

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

3. Sometimes, due to dilutions, re-analysis or SIM/Scan runs are being performed, there will be multiple results for a single analyte from a single sample. The following criteria and professional judgment are used to determine which result should be reported:
    - The analysis with the lower CRQL
    - The analysis with the better QC results
    - The analysis with the higher results

MEMORANDUM

TO: Mr. Haley Royer
Anderson, Mulholland and Associates

DATE: January 14, 2017

FROM: R. Infante

FILE: JC33375

RE: Data Validation
SDG: JC33375

SUMMARY

Full validation was performed on the data for two groundwater samples analyzed for dissolved methane by method RSK-175. The samples were collected at the Bristol Myer Squib-Building 5 Area, Humacao, PR site on December 06, 2016 and submitted to Accutest Laboratories of Dayton, New Jersey that analyzed and reported the results under delivery groups (SDG) JC33375. The sample results were assessed according to USEPA general data validation guidance documents.

In general the data is valid as reported and may be used for decision making purposes. The data results are acceptable for use.

SAMPLES

The samples included in the review are listed below

Client Sample ID	Lab. Sample ID	Collected Date	Matrix	Analysis
OSMW-3S	JC33375-1	12/06/16	Groundwater	Methane
OSMW-4S	JC33375-2	12/06/16	Groundwater	Methane

REVIEW ELEMENTS

Sample data were reviewed for the following parameters, where applicable to the method

- Agreement of analysis conducted with chain of custody (COC) form
- Holding time and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks/trip blanks/field blank
- Canister cleaning certification criteria
- Surrogate spike recovery
- Internal standard performance and retention times
- Field duplicate results
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analysis Conducted with COC Request

Sample reports corresponded to the analytical request designated on the chain-of-custody.

Holding Times and Sample Preservation

Sample preservation was acceptable.

Samples analyzed within method recommended holding time.

Initial and Continuing Calibrations

Initial and continuing calibrations meet method specific requirements. Initial calibration retention times meet method specific requirements.

Method Blank/Trip Blank/Field Blank

Target analytes were not detected in laboratory method blanks.

No trip/field/equipment blank analyzed with this data package.

Laboratory/Field Duplicate Results

Field duplicates were analyzed as part of this data set. Target analytes meet the RPD performance criteria of + 25 % for analytes 5 x SQL.

LCS/LCSD Results

LCS (blank spike) was analyzed by the laboratory associated with this data package. Recoveries and RPD within laboratory control limits.

Quantitation Limits and Sample Results

Dilutions were not performed.

Calculations were spot checked.

Summary

Samples JC33375-1 and JC33375-2 were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document.

Rafael Infante
Chemist License 1888

SAMPLE METHANE DATA SAMPLE SUMMARY

Sample ID: JC33375-1
Sample location: BMSMC Building 5 Area
Sampling date: 6-Dec-16
Matrix: Groundwater

METHOD: RSK -175

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Methane	3.2	ug/l	1	-	-	Yes

Sample ID: JC33375-2
Sample location: BMSMC Building 5 Area
Sampling date: 6-Dec-16
Matrix: Groundwater

METHOD: RSK-175

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Methane	246	ug/l	1	-	-	Yes

EXECUTIVE NARRATIVE

SDG No:	**JC33375**	Laboratory:	**Accutest, New Jersey**
Analysis:	**SW846-8081B**	Number of Samples:	**2**

Location: BMSMC, Building 5 Area
Humacao, PR

SUMMARY: Two (2) samples were analyzed for selected pesticides (Dieldrin) following method SW846-8081B. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

Critical issues: **None**
Major: **None**
Minor: **None**

Critical findings: **None**
Major findings: **None**
Minor findings: **None**

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: Rafael Infante

Date: January 14, 2017

PESTICIDE DATA SAMPLE SUMMARY

Sample ID: JC33375-1
Sample location: BMSMC Building 5 Area
Sampling date: 6-Dec-16
Matrix: Groundwater

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Dieldrin	0.010	ug/l	1	-	U	Yes

Sample ID: JC33375-2
Sample location: BMSMC Building 5 Area
Sampling date: 6-Dec-16
Matrix: Groundwater

METHOD: 8081B

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Dieldrin	0.011	ug/l	1	-	U	Yes

DATA REVIEW WORKSHEETS

Project/Case Number:_____JC33375___
Sampling Date:_____12/06/2016_____
Shipping Date:_____12/08/2016_____
EPA Region No.:_____2_____

REVIEW OF PESTICIDE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JC33375_____ Sample matrix: _____Groundwater_____
No. of Samples: _____2_____

Trip blank No.: _____-_____
Field blank No.: _____FB120616_____
Equipment blank No.:____EB120616_____
Field duplicate No.:_____
Field spikes No.:_____
QC audit samples:_____-_____

___X___ Data Completeness
___X___ Holding Times
__N/A__ GC/MS Tuning
___X__ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
__X____ Laboratory Control Spikes
__X____ Field Duplicates
__X____ Calibrations
__X____ Compound Identifications
__X____ Compound Quantitation
__X____ Quantitation Limits

Overall Comments:__TCL_pesticides_list_(Dieldrin)_by_SW846-8081B_____
_Field_and_Equipment_blanks_validated_in_another_job._____
_____
_____

Definition of Qualifiers:

J-	Estimated results	U-	Compound not detected
R-	Rejected data	UJ-	Estimated nondetect

Reviewer: Rafael Infante
Date:__January_14,_2017_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE EXTRACTED/ANALYZED	ACTION
Samples properly preserved. All samples extracted and analyzed within the required criteria.			

Note:

Criteria

Aqueous samples - seven (7) days from sample collection for extraction; 40 days from sample collection for analysis.
Non-aqueous samples – fourteen (14) days from sample collection for extraction; 40 days from sample collection for analysis.

Cooler temperature (Criteria: 4 ± 2 °C): 5.2°C - OK

Actions

Qualify aqueous sample results using preservation and technical holding time information as follows:

a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

c. If the samples were properly preserved, and were extracted and analyzed within the technical holding times, no qualification of the data is necessary.

d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.

e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

Qualify non-aqueous sample results using preservation and technical holding time information as follows:
a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).
c. If the samples were properly preserved, and were extracted and analyzed within the technical holding time, no qualification of the data is necessary.
d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.
e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met see below ____

GAS CHROMATOGRAPH WITH ELECTRON CAPTURE DETECTOR (GC/ECD) INSTRUMENT PERFORMANCE CHECK (SECTIONS 1 TO 5)

1. Resolution Check Mixture

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? **Yes**? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 60.0%? Yes? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

2. Performance Evaluation Mixture (PEM) Resolution Criteria

Criteria

Is PEM analysis performed at the required frequency (at the end of each pesticide initial calibration sequence and every 12 hours)? **Yes**? or No?

Action

a. If PEM is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

Criteria

Is PEM % Resolution < 90%? Yes? or **No?**

Action

a. a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

All criteria were met ___X___
Criteria were not met see below _____

3. PEM 4,4'-DDT Breakdown

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R)
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

4. PEM Endrin Breakdown

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R)
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

All criteria were met ___X___
Criteria were not met see below _____

5. Mid-point Individual Standard Mixture Resolution -

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? Yes? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 90.0%? Yes? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

Criteria

Is mid-point individual standard mixture analysis performed at the required frequency (every 12 hours)? Yes? or No?

Action

a. If the mid-point individual standard mixture analysis is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

All criteria were met __X____
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____12/08/16_____
Dates of initial calibration verification:_____12/08/16_____
Dates of continuing calibration:_____12/14/16_____
Dates of final calibration_____-_____
Instrument ID numbers:_____GC1G_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and initial calibration verification within the guidance document performance criteria. Continuing calibration % differences meet the performance criteria in the two columns. Final calibration verification included in data package.				

Criteria

Are a five point calibration curve delivered with concentration levels as shown in Table 3 of SOP HW-36A, Revision 0, June, 2015? **Yes**? or No?

Actions

If the standard concentrations listed in Table 3 are not used, use professional judgment to evaluate the effect on the data

Criteria

Are RT Windows calculated correctly? **Yes**? or No?

Action

Recalculate the windows and use the corrected values for all evaluations.

Criteria

Are the Percent Relative Standard Deviation (%RSD) of the CFs for each of the single component target compounds less than or equal to 20.0%, except for alpha-BHC and delta-BHC?

Yes? or No?

All criteria were met __X__
Criteria were not met
and/or see below _____

Are the %RSD of the CFs for alpha-BHC and delta-BHC less than or equal to 25.0%. **Yes**? or No?

Is the %RSD of the CFs for each of the Toxaphene peaks must be < 30% when 5-point ICAL is performed? **Yes**? or No?

Is the %RSD of the CFs for the two surrogates (tetrachloro-m-xylene and decachlorobiphenyl) less than or equal to 30.0%. **Yes**? or No?

Action

a. If the %RSD criteria are not met, qualify detects as estimated (J) and use professional judgment to qualify non-detected target compounds.
b. If the %RSD criteria are within allowable limits, no qualification of the data is necessary

Continuing Calibration Checks

Criteria

Is the continuing calibration standard analyzed at the acceptable time intervals? **Yes**? or No?

Action

a. If more than 14 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of either a PEM or mid-point concentration of the Individual Standard Mixtures (A and B) or (C), qualify all data as unusable (R).
b. If more than 12 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of the last sample or blank that is part of the same analytical sequence, qualify all data as unusable (R).
c. If more than 72 hours has elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene Calibration Verification Standard (CS3), qualify all data as unusable (R).

Criteria

Is the Percent Difference (%D) within ±25.0% for the PEM sample? Yes? or **No**?

Action
a. Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

For the Calibration Verification Standard (CS3); is the Percent Difference (%D) within ± 25.0%? Yes? or **No**?

Action

Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R)
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R)
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

CRQL concentration_____N/A_____

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No target analytes detected in method blanks at a reporting limit of 0.01, 0.02, and 0.25 ug/L				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No target anayte detected in the field/equipment blanks analyzed with this data package. Field/equipment blanks validated in another job.				

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

The concentration of non-target compounds in all blanks must be less than or equal to 10 µg/L. The concentration of each target compound found in the method or field blanks must be less than its CRQL listed in the method.

Data concerning the field blanks are not evaluated as part of the CCS process. If field blanks are present, the data reviewer should evaluate this data in a similar fashion as the method blanks.

Specific actions are as follows:

Blank Actions for Pesticide Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Sulfur Cleanup, Instrument, Field, TCLP/SPLP	Detects	Not detected	No qualification required
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and ≤ blank concentration	Report blank value for sample concentration with a U
		≥ CRQL and > blank concentration	No qualification required
	= CRQL	≤ CRQL	Report CRQL value with a U
		> CRQL	No qualification required
	Gross contamination	Detects	Report blank value for sample concentration with a U

DATA REVIEW WORKSHEETS

All criteria were met __X__
Criteria were not met
and/or see below _____

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix:_Aqueous_____

Lab Sample ID	Lab File ID	S1 a	S1 b	S2 a	S2 b
JC33375-1	1G130505.D	97	90	60	60
JC33375-2	1G130506.D	90	93	77	85
OP99172-BS1	1G130501.D	86	85	45	45
OP99172-MB1	1G130500.D	90	91	42	42
OP99172-MS	1G130503.D	87	88	52	54
OP99172-MSD	1G130504.D	79	77	46	48

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	26-132%
S2 = Decachlorobiphenyl	10-118%

(a) Recovery from GC signal #1
(b) Recovery from GC signal #2

Note: Surrogate recoveries within laboratory control limits.

Actions:

a. For any surrogate recovery greater than 150%, qualify detected target compounds as biased high (J+).
b. Do not qualify non-detected target compounds for surrogate recovery > 150 %.
c. If both surrogate recoveries are greater than or equal to 30% and less than or equal to 150%, no qualification of the data is necessary.
d. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify detected target compounds as biased low (J-).
e. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify non-detected target compounds as approximated (UJ).
f. If low surrogate recoveries are from sample dilution, professional judgment should be used to determine if the resulting data should be qualified. If sample dilution is not a factor:

i. Qualify detected target compounds as biased low (J-).
ii. Qualify non-detected target compounds as unusable (R).

g. If surrogate RTs in PEMs, Individual Standard Mixtures, samples, and blanks are outside of the RT Windows, the reviewer must use professional judgment to qualify data.

h. If surrogate RTs are within RT windows, no qualification of the data is necessary.

i. If the two surrogates were not added to all samples, MS/MSDs, standards, LCSs, and blanks, use professional judgment in qualifying data as missing surrogate analyte may not directly apply to target analytes.

Summary Surrogate Actions for Pesticide Analyses

Criteria	Action*	
	Detected Target Compounds	Non-detected Target Compounds
%R > 150%	J+	No qualification
30% < %R < 150%	No qualification	
10% < %R < 30%	J-	UJ
%R < 10% (sample dilution not a factor)	J-	R
%R < 10% (sample dilution is a factor)	Use professional judgment	
RT out of RT window	Use professional judgment	
RT within RT window	No qualification	

* Use professional judgment in qualifying data, as surrogate recovery problems may not directly apply to target analytes.

All criteria were met ___X___
Criteria were not met
and/or see below _____

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

Data for MS and MSDs will not be present unless requested by the Region.
Notify the Contract Laboratory Program Project Officer (CLP PO) if a field blank was used for the MS and MSD, unless designated as such by the Region.

> **NOTE:** For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:____JC33175-1MS/MSD____ Matrix/Level:__Groundwater___

The QC reported here applies to the following samples: Method: SW846 8081B
JC33375-1, JC33375-2

	JC33175-1	Spike	MS	MS	Spike	MSD	MSD	RPD	Limits
Dieldrin	ND	0.525	0.54	103	0.525	0.49	93	10	42-161/36

> **Note:** MS/MSD sample analyzed with this data package. % recoveries and RPD within laboratory control limits.

Action

No qualification of the data is necessary on MS and MSD data alone. However, using professional judgment, the validator may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

LCS Spike Compound	Recovery Limits (%)
gamma-BHC	50 – 120
Heptachlor epoxide	50 – 150
Dieldrin	30 – 130
4,4'-DDE	50 – 150
Endrin	50 – 120
Endosulfan sulfate	50 – 120
trans-Chlordane	30 – 130
Tetrachloro-m-xylene (surrogate)	30 – 150
Decachlorobiphenyl (surrogate)	30 – 150

LCS concentrations:____0.25_ug/l;_____

List the %R of compounds which do not meet the criteria

LCS ID COMPOUND % R QC LIMIT

_____%_recovery_and_RPD_within_laboratory_control_limits._____
_____
_____
_____

Note:

Action

The following guidance is suggested for qualifying sample data for which the associated LCS does not meet the required criteria.
a. If the LCS recovery exceeds the upper acceptance limit, qualify detected target compounds as estimated (J). Do not qualify non-detected target compounds.
b. If the LCS recovery is less than the lower acceptance limit, qualify detected target compounds as estimated (J) and non-detects as unusable (R).
c. Use professional judgment to qualify data for compounds other than those compounds that are included in the LCS.
d. Use professional judgment to qualify non-LCS compounds. Take into account the compound class, compound recovery efficiency, analytical problems associated with each compound, and comparability in the performance of the LCS compound to the non-LCS compound.
e. If the LCS recovery is within allowable limits, no qualification of the data is necessary.

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? **Yes** or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met _____
Criteria were not met
and/or see below __N/A____

FLORISIL CARTRIDGE PERFORMANCE CHECK

NOTE: Florisil cartridge cleanup is mandatory for all extracts.

Criteria

Is the Florisil cartridge performance check conducted at least once on each lot of cartridges used for sample cleanup or every 6 months, whichever is most frequent? Yes? or No? **N/A**

Criteria

Are the results for the Florisil Cartridge Performance Check solution included with the data package? Yes? or No? **N/A**

Note: If % criteria are not met, examine the raw data for the presence of polar interferences and use professional judgment in qualifying the data as follows:

Action:

a. If the Percent Recovery is greater than 120% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.
b. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
c. If the Percent Recovery is greater than or equal to 10% and less than 80% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is less than 10% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J) and qualify non-detected target compounds as unusable (R).
e. If the Percent Recovery of 2,4,5-trichlorophenol in the Florisil Cartridge Performance Check is greater than or equal to 5%, use professional judgment to qualify detected and non-detected target compounds, considering interference on the sample chromatogram.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the Florisil Cartridge Performance Check analysis not yielding acceptable results.

Note:_ No information for florisil cartridge performance check included in data package. There is evidence tahtFlorisil cartridge was used for sample extraction/clean-up. No qualification of the data performed, professional judgment.

All criteria were met __N/A____
Criteria were not met
and/or see below _____

GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

NOTE: GPC cleanup is mandatory for all soil samples.

If GPC criteria are not met, examine the raw data for the presence of high molecular weight contaminants; examine subsequent sample data for unusual peaks; and use professional judgment in qualifying the data. Notify the Contract Laboratory Program Project Officer (CLP PO) if the laboratory chooses to analyze samples under unacceptable GPC criteria.

Action:

a. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, the non-detected target compounds may be suspect, qualify detected compounds as estimated (J).
b. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, qualify all non-detected target compounds as unusable (R).
c. If the Percent Recovery is greater than or equal to 10% and is less than 80% for any of the pesticide target compounds in the GPC calibration, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
e. If high recoveries (i.e., greater than 120%) were obtained for the pesticides and surrogates during the GPC calibration check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the GPC cleanup analyses not yielding acceptable results.

Note:_ No information for performance of GPC cleanup included in data package. No qualification of the data performed, professional judgment.

All criteria were met ___X___
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

1. Is Retention Times (RTs) of both of the surrogates and reported target compounds in each sample within the calculated RT Windows on both columns? **Yes**? or No?

2. Is the Tetrachloro-m-xylene (TCX) RT ±0.05 minutes of the Mean RT (RT) determined from the initial calibration and Decachlorobiphenyl (DCB) within ±0.10 minutes of the RT determined from the initial calibration? **Yes**? or No?

3. Is the Percent Difference (%D) for the detected mean concentrations of a pesticide target compound between the two Gas Chromatograph (GC) columns within the inclusive range of ± 25.0 %? **Yes**? or No?

4. When no analytes are identified in a sample; are the chromatograms from the analyses of the sample extract and the low-point standard of the initial calibration associated with those analyses on the same scaling factor? **Yes**? or No?

5. Does the chromatograms display the Single Component Pesticides (SCPs) detected in the sample and the largest peak of any multi-component analyte detected in the sample at less than full scale. Yes? or **No**?

6. If an extract is diluted; does the chromatogram display SCPs peaks between 10-100% of full scale, and multi-component analytes between 25-100% of full scale? Yes? or No? **N/A**

7. For any sample; does the baseline of the chromatogram return to below 50% of full scale before the elution time of alpha-BHC, and also return to below 25% of full scale after the elution time of alpha-BHC and before the elution time of DCB? **Yes**? or No?

8. If a chromatogram is replotted electronically to meet these requirements; is the scaling factor used displayed on the chromatogram, and both the initial chromatogram and the replotted chromatogram submitted in the data package. Yes? or **No**?

Action:

a. If the qualitative criteria for both columns were not met, all target compounds that are reported as detected should be considered non-detected.

b. Use professional judgment to assign an appropriate quantitation limit using the following guidance:

i. If the detected target compound peak was sufficiently outside the pesticide RT Window, the reported values may be a false positive and should be replaced with the sample Contract Required Quantitation Limits (CRQL) value.

ii. If the detected target compound peak poses an interference with potential detection of another target peak, the reported value should be considered and qualified as unusable (R).

c. If the data reviewer identifies a peak in both GC column analyses that falls within the appropriate RT Windows, but was reported as a non-detect, the compound may be a false negative. Use professional judgment to decide if the compound should be included.

Note: State in the Data Review Narrative all conclusions made regarding target compound identification.

d. If the Toxaphene peak RT windows determined from the calibration overlap with SCPs or chromatographic interferences, use professional judgment to qualify the data.

e. If target compounds were detected on both GC columns, and the Percent Difference between the two results is greater than 25.0%, consider the potential for coelution and use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, use professional judgment to determine how best to report, and if necessary, qualify the data according to these guidelines.

f. If Toxaphene exhibits a marginal pattern-matching quality, use professional judgment to establish whether the differences are due to environmental "weathering" (i.e., degradation of the earlier eluting peaks relative to the later eluting peaks). If the presence of Toxaphene is strongly suggested, report results as presumptively present (N).

GAS CHROMATOGRAPH/MASS SPECTROMETER (GC/MS) CONFIRMATION

NOTE: This confirmation is not usually provided by the laboratory. In cases where it is provided, use professional judgment to determine if data qualified with "C" can be salvaged if it was previously qualified as unusable (R).

Action:

a. If the quantitative criteria for both columns were met (≥ 5.0 ng/µL for SCPs and ≥ 125 ng/µL for Toxaphene), determine whether GC/MS confirmation was performed. If it was performed, qualify the data using the following guidance:

i. If GC/MS confirmation was not required because the quantitative criteria for both columns was not met, but it was still performed, use professional judgment when evaluating the data to decide whether the detect should be qualified with "C".

ii. If GC/MS confirmation was performed, but unsuccessful for a target compound detected by GC/ECD analysis, qualify those detects as "X".

All criteria were met ___X___
Criteria were not met
and/or see below _____

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC33375-1 tetrachloro-m-xylene RF = 0.816

[ ] = $(146.9 \times 10^6)(50)/(232.3 \times 10^6)(0.816)$
= 38.7 ppb Ok

Action:

a. If sample quantitation is different from the reported value, qualify result as unusable (R).
b. When a sample is analyzed at more than one dilution, the lowest CRQLs are used unless a QC exceedance dictates the use of the higher CRQLs from the diluted sample.
c. Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its corresponding value on the original reporting form and substituting the data from the diluted sample.
d. Results between the MDL and CRQL should be qualified as estimated (J).
e. Results less than the MDL should be reported at the CRQL and qualified (U). MDLs themselves are not reported.
f. For non-aqueous samples, if the percent moisture is less than 70.0%, no qualification of the data is necessary. If the percent moisture is greater than or equal to 70.0% and less than 90.0%, qualify detects as estimated (J) and non-detects as approximated (UJ). If the percent moisture is greater than or equal to 90.0%, qualify detects as estimated (J) and non-detects as unusable (R) (see Table).

Percent Moisture Actions for Pesticide Analysis for Non-Aqueous Samples

Criteria	Action	
	Detected Associated Compounds	Non-detected Associated Compounds
% Moisture < 70.0	No qualification	
70.0 < % Moisture < 90.0	J	UJ
% Moisture > 90.0	J	R

List samples which have ≤ 50 % solids

Note: If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.

Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

All criteria were met __N/A___
Criteria were not met
and/or see below _____

FIELD DUPLICATE PRECISION

NOTE: In the absence of QAPP guidance for validating data from field duplicates, the following action will be taken.

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples. Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the values for each compound. If large RPDs (> 50%) is observed, confirm identification of samples and note difference in the executive summary.

Sample IDs: _____ Matrix:_____-_____

COMPOUND	SQL ug/L	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed with this data package. MS/MSD % recovery RPD used to assess precision. RPD within the required criteria of < 50 %.					

Actions:

a. Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

b. If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

i. If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

ii. If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

iii. If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

iv. If both sample and duplicate results are not detected, no action is needed.

OVERALL ASSESSMENT OF DATA
Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.

2. Write a brief narrative to give the user an indication of the analytical limitations of the data.

Note: The Contract Laboratory Program Project Officer (CLP PO) must be informed if any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

Overall assessment of the data: Results are valid; the data can be used for decision making purposes.

MEMORANDUM

TO: Mr. Haley Royer
Anderson, Mulholland and Associates

DATE: January 14, 2017

FROM: R. Infante

FILE: JC33375

RE: Data Validation
BMSMC, Building 5 Area
SM04.00.06 / 4th Quarter 2016 Groundwater Sampling - Offsite
Accutest Job Numbers: JC33375

SUMMARY

Full validation was performed on the data for two groundwater samples analyzed selected inorganics (iron – ferric and ferrous; nitate-nitrogen; nitrite-nitrogen; nitrate + nitrite – nitrogen; sulfate and sulfide). The methods employed are listed in Table 1. The samples were collected at the BMSMC, Building 5 Area, Humaco, PR site on December 6 2016 and submitted to Accutest Laboratories of Dayton, New Jersey that analyzed and reported the results under delivery groups (SDG) JC33375.

Table 1.

ANALYTE	METHOD	ANALYTE	METHOD
Iron, ferric[a]	SM3500FE B-11	Iron, ferrous[b]	SM3500FE B-11
Nitrogen, nitrate[c]	EPA353.2/SM4500NO2B	Nitrogen, nitrate + nitrite	EPA352.2/LACHAT
Nitrogen, nitrite	SM4500NO2 B-11	Sulfate	EPA 300/SW846-9056A
Sulfide	SM4500S2-F-11		

(a) Calculated as: (Iron) - (Iron, Ferrous)
(b) Field analysis required. Received out of hold time and analyzed by request.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: *USEPA Contract Laboratory program National Functional Guidelines for Inorganic data Review (OSWER 9240.1-45, EPA 540-R-04-004, October 2004- Final),* (noted herein as the "primary guidance document"*).* Also, QC criteria from *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, December 1998),"* and the QC requirements for the methods performed following the Standard Method guidelines are utilized. The guidelines were modified to accommodate the non-CLP methodology. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

In general the data are valid as reported and may be used for decision making purposes. The data results are acceptable for use; some of the results were qualified. Results for ferrous and ferric iron were qualified as estimated (J) in samples: JC33375-1 and -2.

SAMPLES

The samples included in the review are listed below

FIELD SAMPLE ID	LABORATORY ID	ANALYSIS
OSMW-3S	JC33375-1	See Table 1
OSMW-4S	JC33375-2	See Table 1

REVIEW ELEMENTS

Sample data were reviewed for the following parameters, where applicable to the method

- Agreement of analysis conducted with chain of custody (COC) form
- Holding time and sample preservation
- Initial and continuing calibrations
- Method blanks/trip blanks/field blank
- Surrogate spike recovery
- Matrix spike/matrix spike duplicate (MS/MSD) results
- Internal standard performance
- Field duplicate results
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analysis Conducted with COC Request
Sample reports corresponded to the analytical request designated on the chain-of-custody form.

Holding Times and Sample Preservation
The cooler temperatures were within the QC acceptance criteria of 4°C ± 2°C.

Sample preservation was acceptable.

Samples analyzed within method recommended holding time except for the following:

- JC33375-1 for Iron, Ferrous: Field analysis required. Received out of hold time and analyzed by request.
- JC33375-2 for Iron, Ferrous: Field analysis required. Received out of hold time and analyzed by request.

Note: Results for ferrous and ferric iron qualified as estimated (J).

Initial and Continuing Calibrations
Initial and continuing calibration meets method performance criteria.

Method Blank/Equipment Blank/Field Blank
Target analytes were not detected in laboratory method blanks.

No field/equipment blanks analyzed as part of this data package.

MS/MSD
Matrix spike was performed. Recoveries for MS/MSD were within laboratory control limits; RPD for MS/MSD were within control limits.

Field/Laboratory Duplicate Results
Field/laboratory duplicate were analyzed as part of this data set. When no field/laboratory duplicates were analyzed, MS/MSD RPD was used to assess precision. RPD results were within laboratory/recommended control limits except for the following:

- JC33258-1/-1 DUP.: Iron, ferrous- 22.2 % RPD, outside laboratory control limit. No action taken, professional judgment. RPD within generally acceptable control limits.
- JC33375-1/-1 DUP.: Nitrogen, nitrate + nitrite- 60.2 % RPD, outside laboratory control limit. No action taken, professional judgment. Sample and duplicate concentration < 5 x IDL.

LCS/LCSD Results
The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Quantitation Limits and Sample Results

Dilutions were not required with this data set.

Calculations were spot checked.

Summary

The following samples JC33375-1and JC33375-2 were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document. Some of the results were qualified, the results are valid.

Rafael Infante
Chemist License 1888

SAMPLE INORGANIC DATA SAMPLE SUMMARY

Sample ID: JC33375-1
Sample location: BMSMC Building 5 Area
Sampling date: 12/6/16
Matrix: Groundwater

Analyte Name	Method	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Fe	SW846-6010C	3020	ug/l	1.0	-	-	Yes
Mn	SW846-6010C	379	ug/l	1.0	-	-	Yes
Alkalinity, Total as CaCO3	SM2320 B-11	214	mg/l	1.0	-	-	Yes
Iron, ferric	SM3500FE B-11	3.0	mg/l	1.0	-	J	Yes
Iron, ferrous	SM3500FE B-11	< 0.20	mg/l	1.0	-	UJ	Yes
Nitrogen, nitrate	EPA 353.2/SM4500NO2B	< 0.11	mg/l	1.0	-	U	Yes
Nitrogen, nitrate + nitrite	EPA 353.2/LACHAT	<0.10	mg/l	1.0	-	U	Yes
Nitrogen, nitrite	SM4500NO2 B-11	< 0.010	mg/l	1.0	-	U	Yes
Sulfate	EPA 300/SW846 9056A	22.1	mg/l	1.0	-	-	Yes
Sulfide	SM4500S2- F-11	< 2.0	mg/l	1.0	-	U	Yes

Sample ID: JC33375-2
Sample location: BMSMC Building 5 Area
Sampling date: 12/6/2016
Matrix: Groundwater

Analyte Name	Method	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable
Fe	SW846-6010C	3020	ug/l	1.0	-	-	Yes
Mn	SW846-6010C	454	ug/l	1.0	-	-	Yes
Alkalinity, Total as CaCO3	SM2320 B-11	335	mg/l	1.0	-	-	Yes
Iron, ferric	SM3500FE B-11	2.9	mg/l	1.0	-	J	Yes
Iron, ferrous	SM3500FE B-11	< 0.20	mg/l	1.0	-	UJ	Yes
Nitrogen, nitrate	EPA 353.2/SM4500NO2B	< 0.11	mg/l	1.0	-	U	Yes
Nitrogen, nitrate + nitrite	EPA 353.2/LACHAT	<0.10	mg/l	1.0	-	U	Yes
Nitrogen, nitrite	SM4500NO2 B-11	< 0.010	mg/l	1.0	-	U	Yes
Sulfate	EPA 300/SW846 9056A	< 10	mg/l	1.0	-	U	Yes
Sulfide	SM4500S2- F-11	< 2.0	mg/l	1.0	-	U	Yes

DATA REVIEW WORKSHEETS

Type of validation Full:___X_____ Project Number:____JC33375_____
Limited:_____ Date:_____12/06/2016_____
EPA Region:__2__ Date shipped:___12/08/16_____

REVIEW OF INORGANIC ANALYSIS DATA PACKAGE

The following guidelines for evaluating metals analyses (6010C/6020/7000A series method) sulfide, and/or cyanide were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: *Hazardous Waste Support Section SOP N0. HW-3b Revision 0 (July 2015) ISM02 ICP-MS Data Validation; USEPA Contract Laboratory program National Functional Guidelines for Inorganic data Review (OSWER 9240.1-45, EPA 540-R-04-004, October 2004- Final). Validation of Metal for the Contract Laboratory Program (CLP) (SOP HW-2, Revision 13. Based on ILM05.3 (August 2009).* Quality control validation criteria were derived from *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, 1998)".* The project QAPP is reviewed for project specific information (if available). The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for inorganic included:

Lab. Project/SDG No.: ____JC33375_____ Sample matrix: _____Groundwater____
No. of Samples: _____2_____
Field blank No.: _____-_____
Equipment blank No.: _____-_____
Field duplicate No.: _____-_____

___X___ Data deliverables
___X___ Holding Times
___X___ Calibrations
___X___ Blanks
___X___ ICP Interference Check Results
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Duplicates
___X___ Field Duplicates
___X___ Laboratory Control Samples
___X___ ICP Serial Dilution Results
___X___ Detection Limits Results
___X___ Sample Quantitation

Overall Comments: _Fe_and_Mn_(SW846-6010C)_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated non-detect
E- Laboratory qualifier

Reviewer:____ Rafael Infante _____ Date:__01/14/2017_____

DATA REVIEW WORKSHEETS

All criteria were met __X____
Criteria were not met
and/or see below _____

I. DATA DELIVERABLES

A. Data Package:

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

B. Other Discrepancies:

All criteria were met __X___
Criteria were not met
and/or see below _____

HOLDING TIMES
The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of preparation, and subsequently from the time of preparation to the time of analysis.

Complete table for all samples and circle the analysis date for samples not within criteria

SAMPLE ID	DATE SAMPLED	CYANIDE DATE ANALYSIS	Hg DATE ANALYSIS	OTHERS DATE ANALYSIS	pH	SULFIDE	ACTION
SAMPLES DIGESTED AND ANALYZED WITHIN THE METHOD RECOMMENDED HOLDING							

Criteria

Metals – 180 days from time of collection.
Mercury – 28 days from time of collection.
Hexavalent Chromium (solids)- 30/7 from day of collection; 48 hrs aqueous samples
Cyanide – 14 days from time of collection
Sulfide - 14 days from time of collection
pH measurements of aqueous samples upon receipt at the laboratory (criteria pH $\leq$ 2 for metals; pH $\geq$ 12 for cyanide)

Actions: Qualify positive results/nondetects as follows:

If holding times are exceeded, estimate positive results (J) and rejects nondetects (R).
If pH > 2 for metals or pH < 12 for cyanide, positive results (J) and nondetects (UJ).
Cooler Temperature (Criteria: 4°C + 2°C):___5.2°C_____.
If cooler temperature is > 10°C, flag non-detects as (UJ) and detects as (J).

All criteria were met __N/A___
Criteria were not met
and/or see below _____

ICP-MS TUNE ANALYSIS

Is the ICP-MS tuned prior to calibration? Yes or No?

Does the % RSD exceeds 5% for any isotope in the tuning solution? Yes or No?

Action:

NOTES: For ICP-MS tunes that do not meet the technical criteria, apply the action to all samples reported from the analytical run.

1. If the ICP-MS instrument was not tuned prior to calibration, the sample data should be qualified as unusable (R).

2. If the tuning solution was not analyzed or scanned at least 5x consecutively or the tuning solution does not contain the required analytes spanning the analytical range, the reviewer should use professional judgment to determine if the associated sample data should be qualified. The reviewer may need to obtain additional information from the laboratory. The situation should be recorded in the Data Review Narrative and noted for Contract Laboratory Program Project Officer (CLP PO) action.

3. If the resolution of the mass calibration is not within 0.1 u for any isotope in the tuning solution, qualify all analyte results that are ≥ Method Detection Limit (MDL) associated with that isotope as estimated (J), and all non-detects associated with that isotope as estimated (UJ). The situation should be recorded in the Data Review Narrative and noted for CLP PO action.

4. If the %RSD exceeds 5% for any isotope in the tuning solution, qualify all sample results that are ≥ MDL associated with that tune as estimated (J), and all non-detects associated with that tune as estimated (UJ). The situation should be recorded in the Data Review Narrative and noted for CLP PO action.

Table 2. ICP-MS Tune Actions for ICP-MS Analysis

ICP-MS Tune Results	Action for Samples
Tune not performed	Qualify all results as unusable (R)
Tune not performed properly	Use professional judgment
Resolution of mass calibration not within 0.1u	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)
% RSD > 5%	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)

Note: Analytes (As) analyzed by SW846-6010 – no tuning necessary.

All criteria were met __X___
Criteria were not met
and/or see below _____

INSTRUMENT CALIBRATION (SECTION 1)

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data. Minimum of 2 calibration points for ICP-AES and ICP-MS; 5 points for Hg; and 4 points for cyanide. One initial calibration standard at the CRQL level for cyanide and Hg. If no, write in the non-compliance section of the data review narrative.

List the analytes which did not meet the percent recovery (%R) criteria for Initial or Continuing Calibration Verification standards (ICV or CCV).

Acceptance Criteria	ICV %R	CCV %R
Metals by 6010C/6020	100 + 10%	100 + 10%
Mercury/Metals by 7000s	100 + 10%	100 + 20%
Cyanide	100 + 15%	100 + 15%
Sulfide	100 + 15%	100 + 15%

DATE	ICV/CCV#	ANALYTE	%R	ACTION	SAMPLES AFFECTED
INITIAL AND CONTINUING CALIBRATION MEET METHOD SPECIFIC CRITERIA					

ACTIONS: If any analyte does not meet the %R criteria, follow the actions stated below. Qualify five samples on either side of the ICV/CCV out of control limit.

Estimate positive results (J) if:	ICV	CCV
Metals by 6010C/6020	111 – 125%	111 – 125%
Mercury/Metals by 7000s	111 – 125%	111 – 135%
Cyanide	116 – 130%	116 – 130%
Sulfide	116 – 130%	116 – 130%
Estimate positive results and nondetects (U/UJ) if:		
Metals by 6010C/6020	75 – 89%	75 – 89%
Mercury/Metals by 7000s	75 – 89%	65 – 79%
Cyanide	70 – 84%	70 – 84%
Sulfide	70 – 84%	70 – 84%
Reject positive results and nondetects (R) if:		
Metals by 6010C/6020	<75%, >125%	<75%, >125%
Mercury/Metals by 7000s	<75%, >125%	<65%, >135%
Cyanide	<70%, >130%	<70%, >130%
Sulfide	<70%, >130%	<70%, >130%

All criteria were met __X___
Criteria were not met
and/or see below _____

III. INSTRUMENT CALIBRATIONS (SECTIONS 2 & 3)

2. Analytical Sequence

Did the laboratory use the proper number of standards for calibration as described in the method? **Yes** or No

B. Were calibrations performed at the beginning of each analysis? **Yes** or No

Were calibration verification standards analyzed at the beginning of sample analysis and the proper frequency according to the method? **Yes** or No

D. Where the AA correlation coefficients (r) for the calibration curves $\geq$ 0.995? If r < 0.995, estimate positive results and nondetects (J/UJ). It is not necessary to qualify results if the laboratory used order regression. **Yes** or No

Data quality may be affected if any of the above answer are "no". Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the sample affected.

_____

_____

3. Other Check Standards

Laboratories may analyze an additional check standard after establishing the calibration curve. This standard may contain low level concentrations of target analytes and be analyzed and evaluated by the laboratory similar to a CLP "CRLD" standard (CRI for ICP, CRA for AA, and/or mid-range standard for CN and Sulfide). A 100 $\pm$ 20% recovery acceptance limit should be used by the validator to evaluate the standard.

ACTIONS: If any analyte does not meet the %R criteria, follow the action needed below. Qualify 50% of either side of the CRI/CRA out of control limits.

% R	%R < 50%	%R = 50-79%	%R = 121-150%	%R > 150%	Affected Range
Qualify Positive/Nondetects Results					
Metals by 6010C/6020	R/R	J/UJ	J/A	R/A	<2x CRI conc.
Hg/metals by 7000s	R/R	J/UJ	J/A	R/A	<1.5x CRI conc.
Cyanide	R/R	J/UJ	J/A	R/A	<1.5x mid std. conc.
Sulfide	R/R	J/UJ	J/A	R/A	<1.5x mid std. conc.

CRI is not required for Al, Ba, Ca, Fe, Mg, Na, and K.

NOTE: CRLD standard within laboratory and method specific criteria.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

Table 4. Calibration Actions for ICP-MS Analysis

Calibration Result	Action for Samples
Calibration not performed	Qualify all results as unusable (R)
Calibration incomplete	Use professional judgment Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)
Not at least one calibration standard at or below the CRQL for each analyte	Qualify results that are ≥ MDL but < 2x the CRQL as estimated (J) Qualify non-detects as estimated (UJ)
Correlation coefficient < 0.995; %D outside ±30%; y-intercept ≥ CRQL	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as estimated (UJ)
Correlation coefficient < 0.990	Qualify results that are ≥ MDL as estimated (J) Qualify non-detects as unusable (R)
ICV/CCV %R < 75%	Qualify results that are ≥ MDL as unusable (R) Qualify all non-detects as unusable (R)
ICV/CCV %R 75-89%	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as estimated (UJ)
ICV/CCV %R 111-125%	Qualify results that are ≥ MDL as estimated high (J+)
ICV/CCV %R > 125%	Qualify results that are ≥ MDL as estimated high (J+)
ICV/CCV %R > 160%	Qualify results that are ≥ MDL as unusable (R)

All criteria were met __X___
Criteria were not met
and/or see below _____

IV. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including equipment, field, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in Sections 1 & 2 below. A separate worksheet page should be used for soil and water blanks.

Laboratory blanks Matrix:___Aqueous_____

DATE ANALYZED	ICB/CCB#	PREP BLK	ANALYTE	CONCENTRATION UNITS

__No_analyte_detected_in_method_blanks_above_reporting_limits._____

Field/Equipment Matrix:___Aqueous_____

DATE ANALYZED	EQUIPMENT/FIELD BLANK	ANALYTE	CONCENTRATION UNITS
__No_field/equipment_blank_analyzed_as_part_of_this_data_package._____			

Table. Field/Rinsate/Trip Blank Actions for ICP-MS Analysis

Blank Result	Sample Result	Action for Samples
> CRQL	≥ MDL but ≤ CRQL	Report CRQL value with a "U"
	> CRQL but < Blank Result	Report at level of Blank Result with a "U"
	> Blank Result but < 10x the Blank Result	Use professional judgment to qualify results as estimated (J)

All criteria were met __X___
Criteria were not met
and/or see below _____

IV. BLANK ANALYSIS RESULTS (Section 3)

Frequency requirements

Was the preparation blank analyzed for each matrix,
at the frequency of the method? **Yes** or No
If no, estimate positive results < 10x IDL for which preparation blank was not analyzed.
If more than 20 samples/batch, qualification begins at the 21st sample.

B. Was an ICB analyzed? **Yes** or No

C. Was a CCB analyzed at the frequency stated in the method? **Yes** or No

Data quality may be affected if any of the above answer is "no". Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

NOTE FOR SOIL SAMPLES
Compare raw sample value with blank results in ug/L unit, or
Convert blanks analyzed during a soil case to mg/Kg in order to compare them with the sample results.

Conc. In ug/L x [Volume diluted to (mL)]/[Weight digested] x 1L/1000mL x 1000g/1Kg x 1mg/1000□g = concentration in wet weight (mg/Kg)

Concentration, dry weight (mg/Kg) = (Wet weight concentration)/(% Solids) x 100

BLANK ANALYSIS RESULTS (Sections 4,5)

Laboratory blanks (PB, ICB/CCB) must first be used to qualify field and/or equipment blanks and samples.
Any contamination remaining in the field or equipment blank will be used to qualify the associated samples.

All criteria were met __X___
Criteria were not met
and/or see below _____

4. Initial/Continuing Calibration Blanks (ICB/CCB) Actions

Are all ICB/CCBs less than the SQL? **Yes** or No

If no, qualify five samples on either side of the ICB/CCB out of control limits. Estimate positive results (J) ≤ the ICB/CCB value.

ICB/CCB#	ANALYTE	CONC/UNITS	SAMPLES AFFECTED

Are the PB less than the SQL? **Yes** or No

If yes, reject all results (R) < 10x the PB value.

PB	ANALYTE	CONC/UNITS	SAMPLES AFFECTED

BLANK ANALYSIS RESULTS (Section 6)

6. Field/Equipment Blank (FB/EB) Actions

Are the FB/EB less than the SQL? **Yes** or No N/A

If no, was the FB/EB value already rejected due to other QC criteria? Yes or No

If no, reject (R) positive results ≤ 5x the FB/EB value. Reject soil data with raw digest results < 5x the FB/EB value

PB	ANALYTE	CONC/UNITS	SAMPLES AFFECTED

All criteria were met __N/A___
Criteria were not met
and/or see below _____

Table 5. Calibration/Preparation Blank Actions for ICP-MS Analysis - Summary

Blank Type	Blank Result	Sample Result	Action for Samples
ICB/CCB	≥ MDL but ≤ CRQL	Non-detect	No action
≥ MDL but ≤ CRQL		Report CRQL value with a "U"	
> CRQL		Use professional judgment	
ICB/CCB	> CRQL	≥ MDL but ≤ CRQL	Report CRQL value with a "U"
> CRQL but < Blank Result		Report at level of Blank Result with a "U"	
> Blank Result		Use professional judgment	
ICB/CCB	≤ (-MDL) but ≥ (-CRQL)	≥ MDL, or non-detect	Use professional judgment
ICB/CCB	< (-CRQL)	< 10x the CRQL	Qualify results that are ≥ CRQL as estimated low (J-) Qualify non-detects as estimated (UJ)
Preparation Blank	> CRQL	≥ MDL but ≤ CRQL	Report CRQL value with a "U"
> CRQL but < 10x the Blank Result		Qualify results as estimated high (J+)	
≥ 10x the Blank Result		No action	
Preparation Blank	≥ MDL but ≤ CRQL	Non-detect	No action
≥ MDL but ≤ CRQL		Report CRQL value with a "U"	
> CRQL		Use professional judgment	
Preparation Blank	< (-CRQL)	< 10x the CRQL	Qualify results that are ≥ CRQL as estimated low (J-) Qualify non-detects as estimated (UJ)

All criteria were met __X___
Criteria were not met
and/or see below _____

INDUCTIVELY COUPLED PLASMA (ICP) INTERFERENCE CHECK SAMPLE

The assessment of the ICP interference check sample (ICS) is to verify the laboratory's interelement and background correction factors.

1. Recovery Criteria

List any elements in the ICS AB and ICS A solutions which did not meet the %R criteria (80 – 120 %).

DATE ELEMENT %R ACTION SAMPLES AFFECTED

_Interference_check_sample_within_method_performance_criteria___ _____
_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____

ACTIONS:

If an element does not meet the %R criteria, follow the actions stated below

% R	%R < 50%	%R = 50-79%	%R = 121-150%	%R > 150%
Qualify Positive/Nondetects Results				
Metals by 6010C/6020	R/R	J/UJ	J/A	R/A

2. Frequency requirements

Were interference QC samples run at the frequency stated in the method (beginning of the analytical run)? **Yes** or No

If no,
ACTIONS: Estimate positive results (J) all samples for which Al, Ca, Fe, Mg > ICS value.

The data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the samples affected.

_____
_____
_____
_____
_____
_____
_____
_____
_____

All criteria were met ___N/A____
Criteria were not met
and/or see below _____

Table 6. Interference Check Actions for ICP-MS Analysis - Summary

Interference Check Sample Results	Action for Samples
ICS not analyzed	Qualify detects and non-detects as unusable (R)
ICS not analyzed in proper sequence	Use professional judgment.
ICS %R>150%	Use professional judgment
ICS %R > 120% (or greater than true value + 2x the CRQL)	Qualify results that are ≥ MDL as estimated high (J+)
ICS %R 80-12-%	No qualification
ICS %R 50-79% (or less than true value – 2x the CRQL)	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as estimated (UJ)
ICSAB %R < 50%	Qualify detects as estimated low (J-) and non-detects as unusable (R)
Potential false positives in field samples with interferents	Qualify results that are ≥ MDL as estimated high (J+)
Potential false negatives in field samples with interferents	Qualify results that are ≥ MDL but < 10x the (|negative value|) as estimated low (J-) Qualify non-detects as estimated (UJ)

All criteria were met ___X____
Criteria were not met
and/or see below _____

VI. MATRIX SPIKE (MS)

Sample # _JC33148-1MS/-1MSD_____ Matrix:__Groundwater__ Units: __ug/L__

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. Note that for Region 2, MS not required for: Ca, Mg, K, and Na for aqueous matrix.

Al, Ca, Fe, Mg, K, Na, for soil matrix
MS Recovery Criteria. List the percent recoveries for analytes which did not meet the %R criteria (75 – 125%); (85 – 115 % FOR Cr (VI)).

ANALYTE	SPIKE SAMPLE RESULT (SSR)	SAMPLE RESULT (SR)	SPIKE ADDED	% R	ACTION
MS/MSD recoveries and RPD within laboratory control limits.					

ACTIONS: Matrix spike actions apply to all samples of the same matrix. The qualification will also be applied to the results of all samples within a given area of the site, if deemed appropriate.

If the sample results ≥ 4x the spike concentration, no action is taken.
If any analyte does not meet the %R criteria, follow the actions stated below.

Table 9. Spike Sample Actions for ICP-MS Analysis

Spike Sample Results	Action for Samples
Matrix Spike %R < 30% Post-digestion spike %R < 75%	Qualify affected results that are ≥ MDL as estimated low (J-) and affected non-detects as unusable (R)
Matrix Spike %R < 30% Post-digestion spike %R ≥ 75%	Qualify affected results that are ≥ MDL as estimated (J) and affected non-detects as estimated (UJ)
Matrix Spike %R 30-74% Post-digestion Spike %R < 75%	Qualify affected results that are ≥ MDL as estimated low (J-) and affected non-detects as estimated (UJ)
Matrix Spike %R 30-74% Post-digestion spike %R ≥ 75%	Qualify affected results that are ≥ MDL as estimated (J) and affected non-detects as estimated (UJ)
Matrix Spike %R > 125% Post-digestion spike %R > 125%	Qualify affected results that are ≥ MDL as estimated high (J+)
Matrix Spike %R > 125% Post-digestion spike %R ≤ 125%	Qualify affected results that are ≥ MDL as estimated (J)

Spike Sample Results	Action for Samples
Matrix Spike %R < 30% No post-digestion spike performed	Qualify affected results that are ≥ MDL as estimated low (J-) and affected non-detects as unusable (R)
Matrix Spike %R 30-74% No post-digestion spike performed	Qualify affected results that are ≥ MDL as estimated low (J-) and non-detects as estimated (UJ)
Matrix Spike %R > 125% No post-digestion spike performed	Qualify affected results that are ≥ MDL as estimated high (J+) Non-detects are not qualified

2. Frequency Criteria

A. Was a matrix spike prepared at the frequency stated in the method (1/20)? **Yes** or No

If no, estimate positive results (J) for which analyte was not spiked.
If more than 20 samples/batch, qualification begins at the 21st sample.

B. Was a field blank used as spiked sample? Yes or **No**

If yes, estimate positive results (J) < 4x spike level added for the analyte.

A separate worksheet page should be used for each matrix spike

All criteria were met __N/A___
Criteria were not met
and/or see below ____

VII. FIELD DUPLICATES

Sample #:_____-_____ Matrix:_____-_____ Units:_ug/L__

Field duplicate samples may be taken and analyzed as an indication of overall precision. Field duplicate analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which measure only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

List the concentrations and RPDs in the field duplicate pair. RPD criteria: ± 20% for aqueous; ± 35% for soil. For soil duplicates, if the % solids for the sample and its duplicate differ by more than 1%, report concentrations in ug/L and calculate RPD or difference for each analyte.

ANALYTE	SQL ug/L	SQL ug/Kg	SAMPLE RESULTS	DUPLICATE RESULTS	RPD	ACTION
Al						
Sb						
As	No field/laboratory duplicates analyzed with data set. MS/MSD % recoveries RPD used to assess precision. RPD within laboratory and generally acceptable control limits					
Ba						
Be						
Cd						
Ca						
Cr						
Co						
Cu						
Fe						
Pb						
Mg						
Mn						
Hg						
Ni						
K						
Se						
Ag						
Na						
Tl						
V						
Zn						
Cyanide						
Cr(VI)						

Field duplicate actions should be applied to only the sample and its duplicate.

All criteria were met __N/A___
Criteria were not met
and/or see below ____

Actions: Indicates which criterion was used to evaluate precision by circling either the RPD or SQL for each element. If both sample and duplicate are nondetects, the RPD is not calculated (NC), no action is needed.

Table 8. Duplicate Sample Actions for ICP-MS Analysis

Duplicate Sample Results	Action for Samples
Aqueous: Both original sample and duplicate sample > 5x the CRQL and 20% < RPD < 100%	Qualify those results that are ≥ CRQL as estimated (J)
Aqueous: Both original sample and duplicate sample > 5x the CRQL and RPD ≥ 100%	Qualify those results that are ≥ CRQL as unusable (R)
Soil/Sediment: Both original sample and duplicate sample > 5x the CRQL and 35% < RPD < 120%	Qualify those results that are ≥ CRQL as estimated (J)
Soil/Sediment: Both original sample and duplicate sample > 5x the CRQL and RPD ≥ 120%	Qualify those results that are ≥ CRQL as unusable (R)
Original sample or duplicate sample ≤ 5x the CRQL (including non-detects) and absolute difference between sample and duplicate > CRQL	Qualify those results that are ≥ MDL as estimated (J) and non-detects as estimated (UJ)

A separate worksheet page should be used for each laboratory duplicate analysis

All criteria were met __X____
Criteria were not met
and/or see below _____

VIII. LABORATORY DUPLICATES (Section 1)

Laboratory run duplicates samples to verify laboratory consistency and precision. They are a measure of laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

1. Difference Criteria

List the concentrations of any analyte not meeting the RPD criteria (± 20% for aqueous; ± 35% for soil). For soil duplicates, if the % solids for the sample and its duplicate differ by more than 1%, report concentrations in □g/L and calculate RPD or difference for each analyte.

Sample # _____ Matrix:_____-_____ Units: ___-____

ANALYTE	SQL ug/L	SQL mg/Kg	SAMPLE RESULTS	DUPLICATE RESULTS	RPD	ACTION
Al						
Sb						
As						
Ba						
Be						
Cd						
Ca						
Cr						
Co						
Cu						
Fe						
Pb						
Mg						
Mn						
Hg						
Ni						
K						
Se						
Ag						
Na						
Tl						
V						
Zn						
Cr(VI)						
Sulfide						
Cyanide						

Note:

Laboratory duplicates actions should be applied to all other samples of the same matrix type. This qualification will also be applied to the results of all samples within a given area of the site, if deemed appropriate.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

Actions: Indicates which criterion was used to evaluate precision by circling either the RPD or SQL for each element. If both sample and duplicate are non-detects, the RPD is not calculated (NC), no action is needed.

Table 8. Field Duplicate Sample Actions for ICP-MS Analysis

Sample Type	Field Duplicate Result	Action for Samples
Aqueous	Sample and its field duplicate ≥ 5x the CRQL and RPD > 20%	Qualify sample and its duplicate as estimated (J)
	Sample and/or its field duplicate < 5x the CRQL and absolute difference > the CRQL	Qualify results > the MDL as estimated (J) Qualify non-detects as estimated (UJ)
Soil/Sediment	Sample and its field duplicate ≥ 5x the CRQL and RPD > 50%	Qualify sample and its duplicate as estimated (J)
	Sample and/or its field duplicate < 5x the CRQL and absolute difference > 2x the CRQL	Qualify results > the MDL as estimated (J)
		Qualify non-detects as estimated (UJ)

2. Frequency Criteria

A. Was a laboratory duplicate prepared at the frequency stated in the method (1/20)? **Yes** or No

If no, estimate positive results (J) for the analyte which duplicate was not performed. If more than 20 samples/batch, qualification begins at the 21st sample.

B. Was a field blank used for laboratory duplicate analysis? Yes or **No**

If yes, estimate positive results (J) for the analyte if field blank was used for duplicate analysis.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. LABORATORY CONTROL SAMPLE (LCS/LCSD)

The assessment of the LCSs is to determine both intralaboratory contamination and matrix specific precision and accuracy. Note that for Region 2, LCS is not required for aqueous Hg and Cyanide.

LCS Recoveries Criteria

A. Aqueous LCS/Solid LCS

List any LCS recoveries not within %R criteria (80 – 120%) and the samples affected.

DATE ELEMENT % R ACTION SAMPLES AFFECTED

_____Recoveries_within_laboratory_control_limits_____

ACTIONS: If analyte does not meet the %R criteria, follow the actions stated below:

Table 7. LCS Actions for ICP-MS Analysis

LCS Result	Action for Samples
%R 40-69%	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as estimated (UJ)
%R > 130%	Qualify results that are ≥ MDL as estimated high (J+)
%R 70-130%	No qualification
%R < 40%	Qualify results that are ≥ MDL as estimated low (J-) Qualify non-detects as unusable (R)
%R > 150%	Qualify detects as unusable (R) ; non-detects no qualification

All criteria were met __X___
Criteria were not met
and/or see below _____

2. Frequency Criteria

A. Was a laboratory control sample prepared at the frequency stated in the method (1/20)? **Yes** or No

If no, estimate positive results (J) for the analyte if LCS was not performed.

If more than 20 samples/batch, qualification begins at the 21st sample.

All criteria were met __X___
Criteria were not met
and/or see below _____

X. ICP SERIAL DILUTION ANALYSIS (Section 1)

The assessment of the ICP serial dilution analysis is to determine the precision of the laboratory through a 5x dilution.

1. Percent Difference (%D) Criteria:

__X__ Serial dilutions were performed for each matrix and results for the diluted samples analysis agreed within 10% of the undiluted analysis for the analyte concentrations ≤ 50x MDL.

_____ Serial dilutions were not performed for the following target analytes: _____

_____ Serial dilutions were performed, but analytical results did not agree within 10% difference for analyte concentrations > 50x IDL before dilution.

List the %Ds for analytes which did not meet the %D criteria (10%/100%)

Sample # _ JC33148-1_____ Matrix:__Groundwater___ Units:_ug/L__

ANALYTE	IDL	50x IDL	SAMPLE RESULTS	SERIAL DILUTION	%D	ACTION
Al						
Sb						
As						
Ba						
Be						
Cd						
Ca						
Cr						
Co						
Cu						
Fe						
Pb						
Mg						
Mn						
Hg						
Ni						
K						
Se						
Ag						
Na						
Tl						
V						
Zn						

Note: Serial dilution within method performance criteria.

All criteria were met __X___
Criteria were not met
and/or see below _____

ACTIONS: Actions apply to all samples of the same matrix. The qualification will also be applied to the results of all samples within a given area of the site, if deemed appropriate. Qualify only samples with raw results > 50x MDL.

Flag results with an (E) for elements exhibiting %D > 10%.
Estimate (J) positive results > 50x MDL for elements that exhibited %D > 10 but < 100.

Reject (R) positive results > 50x MDL for elements which exhibited %D ≥ 100%.

SERIAL DILUTION ANALYSIS (Section 2)

2. Frequency Criteria

A. Was a serial dilution analysis prepared as required by the method? **Yes** or No

If no, estimate positive results ≥ 50x MDL (J) for the analyte which serial dilution analysis was not performed.

B. Was a field blank used for serial dilution analysis? Yes or **No**

If yes, estimate positive results ≥ 50x MDL (J) for the analyte if field blank was used for serial dilution analysis.

Table 10. Serial Dilution Actions for ICP-MS Analysis

Serial Dilution Result	Action for Samples
Aqueous: Sample concentration > 50x MDL and 10% < %D < 100%	Qualify affected results whose raw data are > MDL as estimated (J)
Aqueous: Sample concentration > 50x MDL and %D ≥ 100%	Qualify affected results whose raw data are > MDL as unusable (R)
Soil/Sediment: Sample concentration > 50x MDL and 15% < %D < 120%	Qualify affected results whose raw data are > MDL as estimated (J)
Soil/Sediment: Sample concentration > 50x MDL and %D ≥ 120%	Qualify affected results whose raw data are > MDL as unusable (R)
Interferences present	Use professional judgment

A separate worksheet page should be used for each serial dilution analysis.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

XI. ICP-MS INTERNAL STANDARDS

Are internal standard added to the sample? Yes or No?

Are the proper number of internal standard added to the sample? Yes or No?

Is the % Relative Intensities for all internal standards in a sample is within 60-125% of the response in the calibration blank? Yes or No?

Note:_ICP-OES_internal_standards_used;_relative_intensities_within_the_guidance_ _document_performance_criteria._____

Action:

NOTE: Apply the action to the affected analytes for each sample that does not meet the internal standard criteria.

1. If no internal standards were analyzed with the run, the sample data should be qualified as unusable (R). Record this in the Data Review Narrative and note for CLP Project Officer (CLP PO) action.

2. If less than five of the required internal standards were analyzed with the run, or a target analyte(s) is (are) not associated to an internal standard, the sample data, or analyte data not associated to an internal standard should be qualified as unusable (R). Record this in the Data Review Narrative and note for CLP PO action.

3. If the % Relative Intensities for all internal standards in a sample is within 60-125% of the response in the calibration blank, the sample data should not be qualified.

4. If the %RI for an internal standard in a sample is not within the 60-125% limit, qualify the data for those analytes associated with the internal standard(s) outside the limit as follows:

a. If the sample was reanalyzed at a two-fold dilution with internal standard %RI within the limits, report the result of the diluted analysis without qualification. If the %RI of the diluted analysis was not within the 60-125% limit, report the results of the original undiluted analyses and qualify the data for all analytes that are ≥ Method Detection Limit (MDL) in the sample associated with the internal standard as estimated (UJ).

b. If the sample was not reanalyzed at a two-fold dilution, the reviewer should use professional judgment to determine the reliability of the data. The reviewer may determine that the results are estimated (J) or unusable (R).

Table 11. Internal Standard Actions for ICP-MS Analysis

Internal Standard Results	Action for Samples
No internal standards	Qualify all results as unusable (R)
< 5 of the required internal standards	Qualify all results as unusable (R)
Target analyte not associated with internal standard	Qualify all analyte results not associated with an internal standard as unusable (R)
% RI < 60% or > 125%, original sample reanalyzed at 2-fold dilution, and % RI of diluted sample analysis is between 60% and 125%	Do not qualify the data
% RI < 60% or > 125%, original sample reanalyzed at 2-fold dilution, and % RI of diluted sample analysis is outside the 60% to 125% limit	Qualify analytes associated with the failed internal standard that are ≥ MDL as estimated (J) and qualify associated non-detects as estimated (UJ)
Original sample not reanalyzed at 2-fold dilution	Use professional judgment Qualify sample results as estimated (J) or unusable ®

XII. DETECTION LIMITS RESULTS

The detection limit assessment is to verify that samples results are within instrument calibration range or linear range (ICP).

Instrument Detection Limits (IDL). Note IDL is not required for Cyanide.

A. IDL/MDL (or lowest quantitation limit used) results were present and found to be al levels that meet the project objectives? **Yes** or No

B. IDL/MDL (or lowest quantitation limit used) were not met for the following elements:_____

2. Reporting Requirements

A. Were sample results on Form I (or equivalent) reported down to the IDL/MDL or lowest quantitation limit used for all analytes? **Yes** or No

B. Were sample weights, volumes, and dilutions taken into account when reporting results (positive and nondetects)? **Yes** or No

If no, the reported results may be inaccurate. Request the laboratory resubmit the corrected data.

3. Sediment Sample Percent Solids (% solids):

A. Were the % solids for any sediment samples < 50% but ≥ 10%? Yes or No
If yes, estimate positive results and nondetects (J/UJ) if the % solids is 10-50%. List the affected samples:_____

B. Were the % solids for any sediment samples < 10%? Yes or No
If yes, reject all results (R) if the % solid is < 10%. List the affected samples:___N/A_____

XI. TOTAL/DISSOLVED OR INORGANIC/TOTAL ANALYTES

A. Were any analyses performed for dissolved as well as total analytes on the same sample(s)? Yes or **No**

B. Were any analyses performed for inorganic as well as total analytes on the same sample(s)? Yes or **No**

If yes, compare the differences between dissolved (or inorganic) and total analyte concentrations. Compute each difference as a percent of the total analyte only when both of the following conditions are fulfilled:

(1) The dissolved (or inorganic) concentration is greater than total concentration, and
(2) greater than or equal to 5xMDL.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

C. Is any dissolved (or inorganic) concentration greater than its total concentration by more than 20%? Yes or **No**

D. Is any dissolved (or inorganic) concentration greater than its total concentration by more than 50%? Yes or **No**

ACTION:
If the percent difference is greater than 20%, flag (J) both dissolved/inorganic and total concentrations as estimated. If the difference is more than 50%, reject (R) both the values.

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results.

_X___ Sample results fall within the linear range for ICP and within the calibration range for all other parameters.

_____ If samples results were beyond the linear range/calibration range of the instrument, were dilution performed?

List the affected samples/elements/dilution:

In the space below, please show a minimum of one sample calculation per method:

ICP/ICP-MS Computer printout

Hg/Metals by AA

Hexavalent Chromium

Cyanide

Others

For soil samples, the following equation may be necessary to convert raw data values reported in ug/L to actual sample concentrations (mg/Kg):

$$\text{Conc. in ug/L} \times \frac{\text{Volume diluted to, mL}}{\text{Weight digested, g}} \times \frac{1\text{L}}{1000\text{ mL}} \times \frac{1000\text{ g}}{1\text{ Kg}} \times \frac{1\text{ mg}}{1000\text{ mg}} = \text{concentration in wet weight mg/Kg}$$

In addition the sample results are converted to dry weight by using the percent solid calculations:

Wet weight concentration x 100 = final concentration, dry weight (mg/Kg) % solids

OVERALL ASSESSMENT

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the QC criteria previously discussed.

2. Write a brief Data Review Narrative to give the user an indication of the analytical limitations of the data. Note any discrepancies between the data and the Sample Delivery Group (SDG) Narrative for Contract Laboratory Program Project Officer (CLP PO) action. If sufficient information on the intended use and required quality of the data is available, the reviewer should include an assessment of the data usability within the given context.

3. If any discrepancies are found, the laboratory may be contacted by the Region's designated representative to obtain additional information for resolution. If a discrepancy remains unresolved, the reviewer may determine that qualification of the data is warranted.

Note:_____